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SURGICAL MEMOIRS

OF THE

Ch. Mott.

CAMPAIGNS

OF

RUSSIA, GERMANY, AND FRANCE,

BY

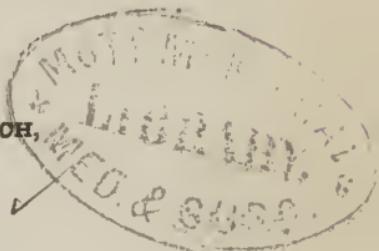
BARON D. J. LARREY,

SURGEON-IN-CHIEF OF THE HOSPITAL OF THE ROYAL GUARD, EX-INSPECTOR
GENERAL OF THE MILITARY MEDICAL STAFF, EX-PRIME SURGEON
OF THE GRAND ARMY IN RUSSIA, SAXONY, ETC.

✓ TRANSLATED FROM THE FRENCH,

BY JOHN C. MERCER,

OF VIRGINIA, STUDENT OF MEDICINE.

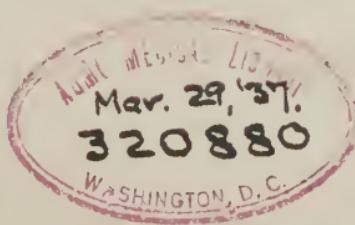


“ In spite, therefore, of the obloquy with which principles have been treated, let us resolve to cultivate them as long as we live. This is my determination, while I am able to totter to this chair; and if a tombstone be afforded after my death, to rescue my humble name for a few years from oblivion, I ask no further addition to it, than that ‘I was an advocate for principles in medicine.’ ”—RUSH.

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TO

THOMAS HARRIS, M. D.

SURGEON OF THE U. S. NAVY,

&c. &c.

THE PATRON OF SCIENCE AND VIRTUE—THE VALUED FRIEND AND
PRECEPTOR OF

'THE TRANSLATOR.

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TRANSLATOR'S PREFACE.

A FEW remarks, tending to point out the various public stations which our distinguished author has occupied in the capacity of surgeon may, perhaps, be the most appropriate introduction to the following pages. His experience, thus made known, cannot fail to strike every one as having been most remarkably extensive. Rare are the examples of medical writers, either of this or any preceding epoch, who can justly assert higher claims to celebrity than Baron Larrey. Bold, enlightened, and abounding in expedients as a surgeon, devoted and energetic as an officer, he enjoyed a pre-eminent reputation in the eyes of Napoleon. Genius is quick in detecting genius, and does not give credit for intellect, where intellect does not exist.

Such undoubtedly was the fact in the present instance. In the mind of Larrey, Buonaparte discovered an energy, which he thought proper to reward by making him surgeon-in-chief of his armies. Happy for his country was this elevation; for while the Emperor executed plans destructive of life, our author exerted his abilities in lessening the misfortunes thus created. Here then, at one period, was talent counteracting talent. But what a contrast has been since, and is still presented in the fate of these two illustrious personages! The genius of the one has withered on St. Helena; that of the other still flourishes, to render stronger his country's pretensions, as the

nursery of medical philosophers. 'The one now exhibits, on a spot in the ocean, in man's last tenement on earth, merely the mouldering remains of an exile, while the other lives in the enjoyment of happy reflections on a life spent in mitigating the ills brought on his country by war's fell influence. May he long survive : and should France, amid the present turmoils in Europe, be again doomed to act a part in the bloody scenes of strife, may he, by his counsel in surgery, subtract from the sufferings of his countrymen. But more especially is it my object in these lines to conduce to the benefit of the reader, and with this view I will now proceed to present the following epitome.

Baron Larrey entered the French navy, as an assistant-surgeon, in the year 1787, and was soon after promoted to the station of a full surgeon. In 1792, he received the commission of a surgeon-major in the army of the Rhine, and two years afterwards was appointed surgeon-in-chief. This office, with the additional one of inspector-general, he enjoyed until the restoration of the Bourbons.

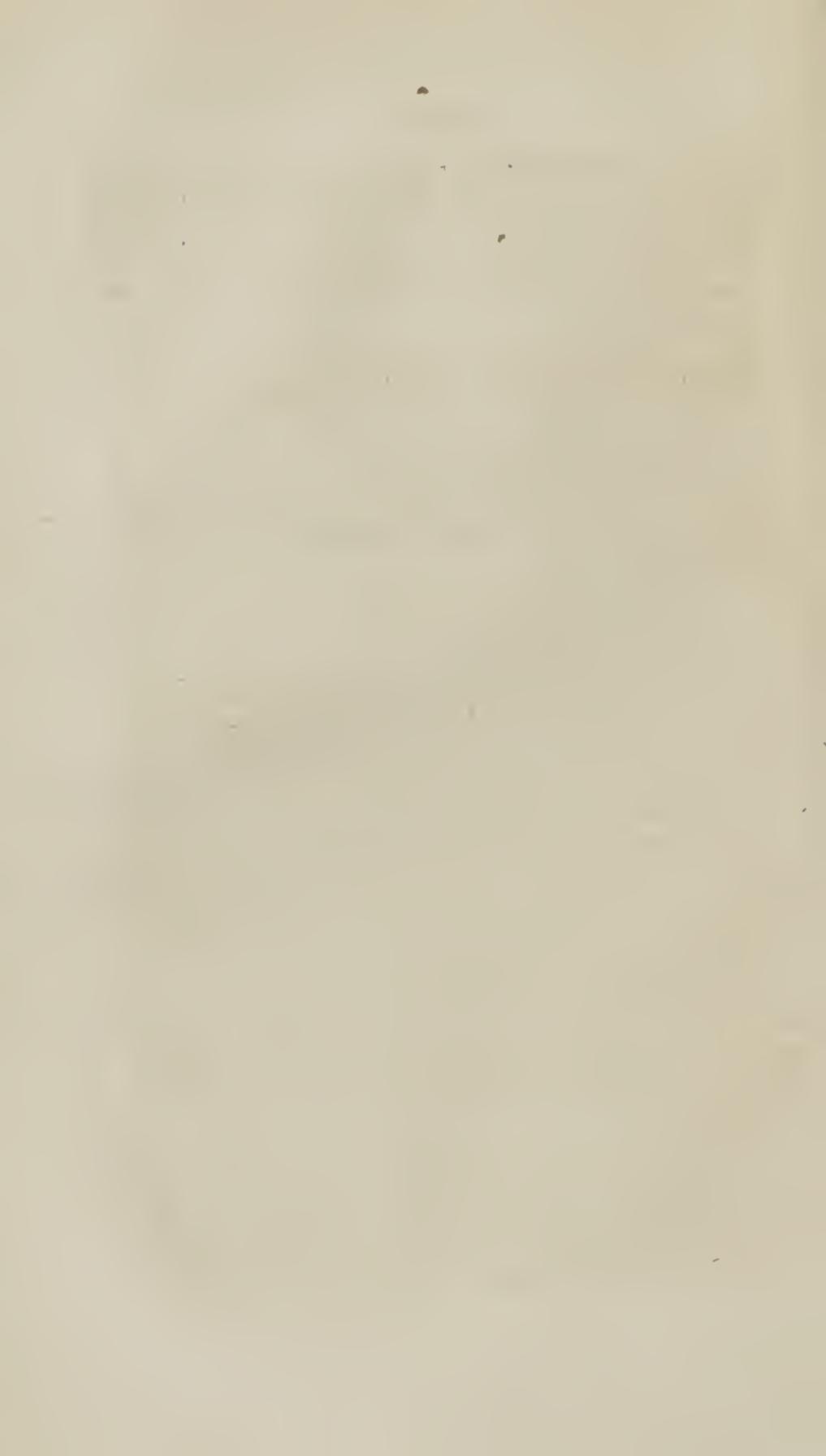
During this period, he was present in almost every great battle, and, in general, performed all the most difficult operations himself. These exceeded fifty or sixty in a day, and on one occasion, if not on more, amounted to two hundred. His *Chirurgical and Military Memoirs* constitute a history of his life. In them are minutely and instructively described, the countries and cities through which he passed, the people with whom he associated, the wounds he witnessed, and operations he performed, the battles in which he was engaged, and sufferings he experienced, and, in fine, various other things of interest. These *Memoirs*, as the author himself states, are modelled after those of Ambrose Paré.

The medical reader is, perhaps, well acquainted with Dr. Hall's translation of the first three volumes of this

work. Subsequently to the publication of this translation, Baron Larrey's fourth volume appeared in Paris, and the following pages exhibit its English version.

These memoirs are thus completed in our own tongue. May I be permitted to ask a lenient critique for my first literary effort ? Its chief merit consists in a faithful adherence to the meaning and style of the author, and I am not unconscious of the benefit that would have attended my labours, had I acted conformably to the "*decies castigata,*" &c. precept of Horace. But the execution of this object would have involved the consumption of more time than I could devote to such an occupation.

Philadelphia, 1832.



CAMPAIGNS AND MEMOIRS.

CAMPAIGN IN RUSSIA.

PART THE FIRST.

PROMISING myself the repose, which very active duties in a war of twenty years duration should have secured for me, I formed the design of collecting the notes contained in the journal of my campaigns, with the view of submitting them for publication, and thus rendering my labours profitable to younger military surgeons.

This difficult task, which I imposed upon myself, had scarcely been accomplished at the expiration of the year 1811, by the publication of three volumes of my Memoirs, when we were apprized of the great preparations of the government for the purposes of war, and of the measures in progress, indicative of a distant expedition.

My fears on this point were by no means tardily confirmed by the reception of an unexpected order of departure, accompanied by the decree (of February 12th, 1812) appointing me surgeon-in-chief of the grand army. I could no longer entertain my doubts respecting the opening of a new campaign.

Mentz was fixed upon as the place of rendezvous for the head-quarters of the army. Previously, however, to repairing thither, I was engaged, so far as it was my duty to act, with the organization of the medical staff of the hospital for the guard, and the necessary appointments to its *ambulances*, the special management of which was

confided, agreeably to a proposition on my part, to M. Paulet, adjunct surgeon-in-chief.

I left Paris on the 24th of the same month, and reached Mentz on the first of March. This day was spent in visiting the military authorities. On the succeeding one, I received instructions necessary for the organization of my staff, from M. Joinville, the director and comptroller general pro temp. The greater portion of the troops, constituting the army, had already crossed the Rhine, and were marching with hasty steps towards Prussia. The object of the expedition was not known; but it was generally supposed, that an embarkation would be effected on the Baltic, for the purpose of passing over to England, or to other countries more remotely situated. The head-quarters of the army bringing up the rear of the troops, departed from Mentz, on the eighth of March, and arrived at Fulde on the twelfth. After remaining here some time, they moved on to Erfurt, which place we reached on the eighteenth.

An order, commanding our presence at Magdeburg, was soon received. The bad state of the weather, together with the ruinous condition of the roads, caused by the artillery, rendered this march, though short, extremely laborious.

During our stay at Magdeburg, M. Baron Desgenettes, physician-in-chief of the army, and myself, took steps for the improvement of the hospitals.

This city, one of the most commercial in Germany, had become, under the French government, an almost impregnable fortress. It formed a considerable depot for arms, and an immense magazine for the armies of the confederation of the Rhine, and in the lapse of time would have been rendered one of the principal citadels of the Elbe, and one of the strongest keys to Saxony. The fortifications and preparations for a siege were conducted with much activity. The cathedral and arsenal should not be unnoticed. This city gave birth to the celebrated Otho Guericke, the inventor of the pneumatic apparatus.

From Magdeburg the head-quarters of the army were ordered to proceed to Berlin, taking Brandenburg in their route.

On our arrival in the former city, (April the second,) I col-

lected together all the surgeons of the army, with the view of rendering myself acquainted with their merits, and assigning distinct situations, to be occupied by each one individually, in our *ambulances*. I instructed them in military surgery, and obliged them to perform operations in my presence. The junior surgeons in the academy of Berlin contended with ours in point of zeal and emulation. They attended my lectures with regularity, and participated in the labours of the amphitheatre. M. Chevalier Görcke, surgeon-general of the Prussian armies, excited them to these exertions. This celebrated practitioner entertains a permanent solicitude for the welfare of his pupils; he is prodigal of his attention towards them, and affords them all the assistance which one could expect from a parent. We were very kindly treated by this respectable professional brother, and it will always be a source of pleasure to recall those evidences of interest manifested towards us by MM. Hufeland; Græffe, professor of surgery; Wibel, physician-in-chief of the armies, and Rudolphi, professor of anatomy and director of the anatomical museum.

I was much gratified on paying a second visit to this rich museum, and observed in it some specimens of dissected vessels, which prove that the anatomists of Berlin have carried the art of injections to the degree of perfection presented by those of Prochaska and Sæmmering. The preparations of injected synovial membranes, ligaments, and articulating extremities of the bones, possess much beauty. Embryos of extreme curiosity, because of their organic derangements, are likewise contained in this valuable collection. I remarked, as being a matter of singularity, in the prepared stomach of a horse, the chrysalis of the horse-fly. As soon as this nympha approximates the period of its metamorphosis, it is detached from the stomach, ascends to the œsophagus, should it be near the latter, or else reaches the intestinal canal, and is exhibited externally under the form of a perfect insect. It frequently happens, that this change is effected in the mouth of the animal or in the rectum. This fact has induced some naturalists to believe that this fly passes through the whole intestinal apparatus, without difficulty, and in different directions. The insect, soon after being extricated from the *prima viæ* of the animal, attaches itself to a favour-

able point on the surface of his body, and there deposits its eggs. The horse removes with his tongue, and swallows the latter, and the heat of the animal causes them to be speedily hatched in his stomach. The larvæ secreting themselves between the folds of this organ, are there nourished, and grow with rapidity. They are soon converted into nymphæ, or chrysalides, and are subsequently changed into flies as we have already remarked.

Another object possessed of no less curiosity, though by no means unknown, is the male and female *pipa*, which we saw in this museum. The cabinet of the king at Paris also contains these *pipæ*. The female presents on its back a kind of honey-comb, or rather a series of round perforations, very contiguous to each other, and under different degrees of dilatation or contraction. During the period at which they lay their eggs, these openings are dilated, and, as this process is effected, the male *pipa* seizes the eggs with its anterior claw, and deposits them in the foramina, which are successively filled. The hatching takes place in them, and the young are there nourished until their metamorphosis; they are then finally discharged from this situation. These foramina are constantly filled with a mucilaginous substance, which undoubtedly serves for the nourishment of these curious animals.

I will give, in another place, an account of some surgical diseases, observed by us in the hospitals of Berlin.

Previously to my departure from this capital, I organized six divisions of flying *ambulances*, each one consisting of eight surgeons. The surgeons-major exercised their divisions daily, according to my instructions, in the performance of operations, and in the application of bandages. The greatest degree of emulation, and the strictest discipline, were prevalent among all the surgeons.

We left Berlin on the thirtieth of April, and reached Franckfort on the Oder, May the second. During our stay here, I employed myself in perfecting our *ambulances*, and causing improvements to be effected in the hospitals, which we found in a very bad state.

Two remarkable monuments justly merit the admiration with which strangers behold them. One is the tomb of General Kleist; the other, situated on the right bank of the river, at a very short distance from the bridge, is a mauso-

leum, erected in honour of Prince Leopold, of Brunswick, governor of the city, in order to perpetuate the commemoration of the heroic act of devotion, of which he was the victim, in April, 1795. Emblematic statues, of exquisite workmanship, describe the virtues of the prince, and the lamentations of the inhabitants.

On the tenth of May, we arrived at Posen. The object of the campaign was still unknown to us; the corps of the army were in the mean time increasing, and formidable troops of artillery, and numerous equipages were advancing from all quarters. An opportunity being afforded me by several days of rest in this city, I availed myself of it in order to organize the flying *ambulances*, and cause my assistants to exercise themselves in the performance of operations. We instituted new researches into the nature and causes of plica polonica. They confirmed me in the opinion I adopted respecting it, during the first campaign in Poland, viz. that this affection is nothing more than a factitious disease.

The grand army soon arrived on the left bank of the Vistula. The enumeration which was made at the time of its passage, gave us about four hundred thousand men, there being equally as many infantry as cavalry troops. These soldiers consisted of French, Spaniards, Neapolitans, Italians, Austrians, Prussians, Bavarians, Wirtembergers, Westphalians, and Saxons, forming ten corps, comprising the guard and their cavalry. Skilful generals, subject to the orders of Napoleon, commanded these troops. The head-quarters of the army, marching in the rear, proceeded to Thorn, which place we reached on the morning of the second of June. On the following day, the different authorities assembled, for the purpose of holding secret councils. I was a member of the grand council presiding over the hospitals. Having collected the opinions and observations of each of these bodies, respecting the departments of business delegated to it, the commander-in-chief of the army issued an order of the day, in which were laid down the march of the troops, and the precautions to be adopted in order to pass with all possible celerity those desert countries, which lay in our way to Russia.

After a general review, we continued on our march, and arrived at Hielsburg June the tenth, the anniversary of

the battle fought by the French before this city, in 1807, during the first campaign in Poland. There was no delay in this place, and the head-quarters of the army received orders to pursue the road to Tilsitt. But this route was soon abandoned, and that to Kowno resumed, where we arrived on the twenty-fourth of June. Some troops of the Russian advanced guard, then in this city, had scarcely time to destroy the bridge, and betake themselves to flight. Our advanced troops, however, passing the Niemen in boats, attacked a part of the rear-guard, and some engagements ensued, in which an hundred of our men were wounded. I caused them to be located in the hospitals of Kowno. This city is advantageously situated on the right bank of the Niemen, at the extremity of a hill, extending in a winding manner, as far as the environs of Wilna. The road runs at the base of this eminence, and borders on a very deep stream, which, following the course of the mountain, isolates the path, and renders it impossible to return, after having once entered upon this route.

We had a laborious march from Kowno to Wilna, in consequence of the bad state of the roads, the constant rains, and the want of shelter. These unfavourable circumstances, in conjunction with the immoderate use of *chenaps*, (the brandy of the country,) proved fatal to a large number of the conscripts of the junior guard. This liquor, particularly when drunk in too large quantities, undoubtedly has an injurious effect on persons not habituated to its employment. It is obtained from corn, and is made by adding to the fermented liquor of this grain, exciting plants of the narcotic class. The latter impart to it a stupefying power, which was fully exemplified in the young soldiers. Those who died from the effects of the abuse of this drink, presented the following phenomena, viz.: loss of muscular movements, vertigo, and drowsiness; the eyes half-closed, dull, weeping, and the conjunctiva appearing as though injected. They, in fine, sat down in the ditches, even in the roads, and there frequently perished. Many presented gangrenous spots on their feet and legs.

Our advanced guard entered Wilna without encountering much resistance. On the day preceding their arrival, the Emperor Alexander was still remaining in this town, and had not the most distant idea that the French were

approaching with so much rapidity. In the petty fights that ensued at the gates, or in the environs of the city, we had one hundred and fifty of our men wounded, who were conveyed, by my direction, to the two hospitals of Saint Jacques and La Charité. It were impossible to bestow a sufficiency of eulogy on the gray sisters of these establishments for the assiduous attention with which they so prodigally administered to our sick.

Among the wounded whom I operated upon, and caused to be dressed in my presence, there were some that presented singular phenomena. The first was a Polish officer, who was wounded twenty-four hours previous. His body was inflated to an extreme degree, by a general emphysema, and the skin so distended as to render the limbs stiff and inflexible; the folds surrounding the joints were also effaced, and the eyes entirely closed by the turgescency of their lids. The lips acquired a prodigious thickness, and impeded the passage of liquids into the mouth; the pulse and respiration had nearly ceased, anxiety was extreme, and the voice feeble and interrupted; in short, it may be said that this officer was in imminent danger.

The spear of a Cossack had penetrated obliquely under the inferior angle of the left scapula into the thorax, effecting at the same time a lesion of the lung. Although the wound in the integuments was not on a line with the division of the intercostal muscles, its lips were united with exactness, by means of adhesive plaster. The patient was then placed in a cart, and conveyed to Wilna, which place he reached during the night. The air, continually issuing from the lung, escaped through the aperture in the thorax, and spread itself into the cellular tissue, whence it expanded through the body, giving rise to this enormous emphysema.

In the treatment of this case, I, in the first instance, removed the adhesive straps, laid open the wound, and brought it on a line with the perforation in the thorax. Dry cups were immediately applied to the wound, and were speedily filled with gas and blood. I then brought together its lips, and kept them in their relative situation by means of linen dipped in warm camphorated wine. Cups with scarifications were applied over the whole

surface of the body, but chiefly to the thorax and extremities.

By my direction embrocations with camphorated and ammoniated wine were employed frequently during the day. The scarifications were repeated as often as necessary. Those parts to which cups could not be applied were simply pricked. I prescribed, as a drink, the infusion of *arnica montana*, in conjunction with rich broth and good wine.

The patient was much relieved after his wound was dressed; his danger disappeared, and he improved from day to day. At the period of our departure, two-thirds of the body were freed from their inflation, and every thing indicated a speedy recovery. On our return from Moscow I had an opportunity of seeing this officer. So great an improvement had taken place in his condition, that I should not have recognized him, had he not made himself known to me. I was in no slight degree astonished at this cure.

A countryman of one of the neighbouring farms, dangerously wounded by a ball in the left shoulder, when very contiguous to the wounding instrument, was conveyed to the same hospital a short time after the Polish officer. The superior sister of this institution entreated me to visit him, and afford him the benefit of my services. I recognized, at first sight, the injury sustained by the wounded part; but previously to making any examination, I requested the attendance of M. Professor Bécu, surgeon-major of the hospital.

The ball had traversed the arm, from before backwards, very near the shoulder. The muscles, brachial nerves, and axillary artery, had been ruptured or lacerated, the humerus shattered below the head, and throughout a great portion of the body of the bone. The limb was cold, insensible, deprived of all motion, and menaced with complete sphaelus. The shoulder and corresponding part of the thorax were labouring under a very extensive ecchymosis. The wounds caused by the entrance and exit of the ball, being small, and not pointing out evidently the disorder which I presumed to exist, the members of the consultation, in the first instance, supposed my proposition to remove the limb, not justified by the necessities of the case, and that

the subject of the wound would be enabled to preserve his arm. They, however, yielded to my views, and advised the immediate performance of the operation. Notwithstanding the disorder of the parts, I was capable of pursuing my method. The operation was tedious and difficult, in consequence of a part of the head of the humerus, which was fractured, being driven through the meshes of the brachial plexus, under the sub-scapular muscle; the artery also being ruptured high up, I was obliged to search for it under the pectoral muscle, for the purpose of throwing the ligature around it. This patient had completely recovered, when, through the influence of causes unknown to me, he was attacked, several months subsequently, by an internal malady, which eventuated in his death.

Several other interesting cases of wounds were treated under my supervision in this hospital. My observations on the nature of these injuries, and their treatment, will be reported in other articles.

During the few days we continued at Wilna, I observed and watched the progress of *plica polonica*. The professors politely exhibited to us some cases of this affection, in the persons of a few females, who had been, for a long period, languishing inmates of the hospital of Saint Jacques. They were said to be affected with general *trichoma* and *plica* of a more or less hideous aspect, which had been brought on with the view of establishing a crisis in their preponderant malady. In fact, in almost all of these females, ulcers or cicatrices of a bad appearance were observed on different portions of the body. In both cases, the man of experience could detect traces of an inveterate scrofulous or venereal taint. MM. Castel, Ribes, and several other French physicians, entertained the same opinion with myself. These views were not adopted by the professors, who supposed that this condition of things was caused by the existence of a true *trichoma*, accompanied by *plica*, which was characterized, in some of these females, by a state of the hair resembling twisted wicks matted into a thick cap; in others, by masses resembling felt, abounding in filth and vermin. In all, however, the roots and extremities of the hair labouring under *plica*, were constantly free from disease, and in a natural state. On this point we grounded our arguments, and the professors were incapable of solving this problem.

We unavailingly requested them to remove the whole of the hair affected with *plica*, and to subject all these women to a methodical treatment, based on the mercurial preparations. This advice was rejected, and each party adhered to their respective opinion, thus exemplifying the very great difficulty with which prejudice is eradicated. Gadowski, a young Polish physician, more candid and precise in his observations, disclosed these errors in his inaugural dissertation on *plica*. Doctor Gasc, a French practitioner, has just written a work especially on this pretended malady; and has left no *desideratuni* on this point.

The anatomical museum, commenced but a very short time previous, was exhibited to us by one of the professors. We observed in it, however, some singular preparations, particularly a collection of the heads of numerous malefactors. These offenders were executed by a species of guillotine, which had been used throughout Lithuania, for a very great number of years. One of these crania was that of a man renowned for his crimes and courage.

After having frequently escaped from prison, and fallen again into the hands of justice, he was about suffering capital punishment, to which he had been doomed, when, for the purpose of escaping this kind of death, he attempted his destruction by removing the principal part of his genital organs. He endeavoured to effect his object by means of a small dull knife, which he had cunningly concealed. Notwithstanding several efforts, it was with difficulty that he opened the scrotum, and laid bare one of the testicles. Urged on doubtless by the occasion, and by his impatience, he seized it with his fingers, and suddenly tore it from its connexions. The spermatic cord was ruptured high up in the abdomen. The most acute pain was immediately succeeded by syncope and other alarming symptoms, which caused a suspension of this criminal's execution. He was conveyed to the hospital, whence he escaped a short time after, to resume his practices as a poacher. The testicle which was removed, was found in his possession. It was put into spirits of wine, in which it was preserved. About three inches of the cord were attached to it.

After having been again guilty of many murders, this wretch was retaken, condemned anew, and immediately beheaded.

There was also contained in this cabinet, the skeleton of a dwarf, of whose birth nothing was known. He was frequently seen in the forests of Lithuania, clad in the unprepared skins of animals. His body was covered with hair. He rarely approached any habitation, and fed on the flesh of animals and wild fruits, of which he doubtless made provision in the proper season. These are the only details we could collect respecting the life of this man, whose cranium appeared to me to resemble strongly the head of the savage of Aveyron, which I saw in the possession of Doctor Itard, on my return from Egypt.

The skeleton of the savage of Lithuania is very analogous to that of the orang-outang. The cranium is very small, when compared with that of persons even of this stature and age. There is scarcely any forehead; the occiput is well developed, and projects very much at the occipital protuberance. The maxillæ are very salient at the dental arches. The incisor and canine teeth, of a shining white, are nearly conical, sharp, and longer than in the ordinary state. The superior extremities possess a greater degree of length than those of a well-formed man; the inferior are proportionally very short, and the bones of the heel extend very far backwards.

I will make no reflection on the character and habits of this individual.

Necessary measures were adopted by us for the successive reception and careful treatment of six thousand patients in Wilna.

An order of the day, issued on the ninth of July, regulated the march of the grand army and that of the head-quarters.

The minor head-quarters of the army received orders to hold themselves in readiness for a departure after the review, which should take place on the tenth. Being officially invited to the levee of the commander-in-chief of the army, I there received a direct order to repair to the review with our flying *ambulances*. The hour of four o'clock was appointed, but it did not take place until six o'clock. The weather was warm and calm, but the thick clouds that obscured the horizon, menaced us with a storm, which broke forth some moments subsequently. When the trumpet announced the arrival of the emperor, claps of thunder were heard in uninterrupted succession, and a dreadful

tempest ensued. The heavens were darkened to such a degree, that persons could not be recognized at a very short distance, but by the flashes of lightning. Large pieces of hail, driven with violence by the impetuous winds, caused the lines to be broken, and forced the horsemen to alight, in order to avoid being thrown. The terrified horses betook themselves to flight, and rushed with violence against each other. We were in an instant inundated with vast bodies of hail and rain. The review, in short, was interrupted, and Napoleon, accompanied by his chief officers, forced to return to the city. I have never witnessed so horrific, so frightful a storm. Was it the sinister foreboding of the misfortunes which awaited us?

We did not delay our march, however, to Mentianoni and Benchenkowiski. Here our advanced troops attacked those of the Russian rear-guard. A battle ensued, which was rendered more obstinate, in consequence of the extremely advantageous position of the enemy. Our troops, notwithstanding, advanced boldly against their lines, broke their ranks, and forced them to retreat with precipitation. This fight put into our hands about six hundred French and five hundred Russian wounded, who were not removed from the field of battle.

These patients, who were conveyed by my direction to the Jewish temples in this last named city, received the assistance from us, to which they were entitled. I will mention some upon whom I operated.

A Russian colonel, who was among the first taken to the hospital, had received from one of our horsemen, a stroke with a sabre, which cut off his nose at its base throughout its whole length. The instrument, being directed obliquely, had effected a division of the two canine regions, and two lateral parts of the upper lip, extending into the substance of the two maxillary bones on a level with the nasal fossæ. This division was bounded by the palatine arch, which formed a part of the flap, turned over upon the chin, and remaining adherent to the living parts of the face, merely by two small shreds of the upper lip, forming the commissures of the mouth. The entire extent of the nasal fossæ and the cavity of the mouth, without the alveolar arch, were seen on one side, and on the other, the flap formed by the whole of the nose, the upper lip, and the palatine

vault, hanging over the chin. One of my pupils, finding this flap cold, and attached to the other portions of the face only at the two points, of which we have spoken, was proceeding to detach it entirely and dress the wound, according to the indications it presented, when I arrived at the bedside of the patient. I laid aside the scissors of the surgeon, and after examining the wound, arranged every thing, for the purpose of employing the suture. I had some difficulty in removing the clots of blood, which filled the nasal fossæ, and had been made hard by dust. I then detached the portion of the palatine vault, which adhered to the flap. It consisted of the anterior half of the superior alveolar arch. It had been separated from the remainder of the maxilla, on one side, between the canine and first molar, and on the other between the first two molar teeth. I also detached from the flap, several pieces of the proper bones of the nose, and ascending processes of the maxillary bones. The nose and lip were placed in their relative position, and I proceeded to reunite them with the surrounding parts, by the interrupted suture, commencing at the root of the nose, and descending successively on its sides, the edges of which were approximated by ten parallel points of the suture. A piece of fine linen dipped in salt water, was applied over the whole extent of the triangle, which was formed by the wound. I introduced into the nostrils two portions of large gum elastic sounds, for the purpose of preserving their form and diameter. They were commanded on the exterior by means of a thread, which I inserted into their anterior extremities. Graduated compresses were placed on the side of the nose, and a retentive bandage terminated the dressings. I had the satisfaction to learn, on my return from Moscow, that this superior officer had perfectly recovered without any deformity. The cure of this case is remarkable, on account of the seriousness of the wound, and the few vessels which kept up a communication between the flap, and the integuments of the face. Vitality was restored to the nose, and its reunion with the edges of the wound was exact and perfect.

Several partial amputations of the foot, of the leg, through the substance of its condyles, with removal of the fibula and of the arm at its articulation with the scapula, were

performed in the same day, and in general proved completely successful. Those possessing the greatest interest will be reported in my account of these operations.

From Benchenkowiski we marched to Witepsk. We arrived in the vicinity of this city on the evening of July the twenty-sixth, and on the following day came up with the enemy, who had stationed themselves before it. An attack was almost immediately commenced on our part. A battle ensued, and victory decided for neither party, in consequence of the very advantageous position of the Russians on the border of a semi-circular hill, defended by a river which had been deprived of its bridges by the enemy. The city is situated on an elevated plain, which is at the termination of this eminence.

Measures were adopted by us in the night for the purpose of turning this position, and establishing bridges, at those points of the river where it was most practicable.

At break of day it was perceived that the Russians had effected their retreat. Our army marched hastily into Witepsk with the view of pursuing them, but in consequence of no knowledge being had of the direction of their retreat, the commander-in-chief of the army issued an order for a retrograde movement. He returned to the city with his chief officers and guard, as much for the purpose of obtaining information respecting the manœuvres of the Russian army, as to recruit his troops, which until that period had been constantly making forced marches. The want of sustenance was already experienced, and the soldiers had not received their regular distributions for many days.

During our first passage towards Witepsk, we observed many appropriate situations for the establishment of hospitals, which were highly necessary. They were immediately fitted up for the reception of the wounded in the battles of the twenty-seventh, twenty-eighth, and twenty-ninth of July. There were about seven hundred and fifty on the side of the French, and nearly as many on the side of the Russians.

I had much difficulty in procuring the primary dressings of the wounded on the field of battle. It became necessary to make use of the linen of the soldiers, and even our own shirts, for effecting this object. Three hundred and fifty

of the most helpless Russians had been forgotten or abandoned in different houses, from which the inhabitants had fled. Notwithstanding the examinations which I caused to be instituted, I did not discover them until the fourth day. It would be difficult to describe the lamentable spectacle presented by these unfortunate individuals, who, with few exceptions, had been mutilated by the fire of artillery. They had been incapable of leaving their place of retreat with the view of demanding relief. We found them lying on dirty straw, heaped one upon the other, and living, as it were, in an atmosphere of infection itself. Mortification or hospital gangrene had destroyed the limbs of the majority who had been lacerated by the gunshot injuries, and all were dying of hunger. Food was in the first place speedily supplied to these unfortunate individuals. I then caused their wounds to be dressed, and performed on many those operations that were the most difficult. They were finally conveyed with our wounded to the hospitals, prepared for this object, in which they received the same assistance and attention as the French.

Forty-five amputations of the arm, fore-arm, thigh, and leg, were performed in my presence by the surgeons-major of our light *ambulances*. Those operations, that were executed in the first twenty-four hours, generally proved successful; those, on the contrary, which were delayed until the third, fourth, or fifth days, were not attended with such fortunate issues. This difference has been perceived and observed by all army surgeons, and there can remain no doubt, as to the necessity of an immediate amputation, when it is indicated.

Among the serious wounds, there were some of a very remarkable character.

The first occurred in an officer of the ninety-second regiment, who received a ball into his bladder. It was extracted by the operation of lithotomy, and the patient recovered before the thirtieth day. This operation forms the subject of a memoir, which will be placed at the conclusion of the campaign.

The second wound was observed in a Russian soldier, whose left thigh was disorganized by a cannon-ball. The femur was shattered as high as the trochanter, and the soft parts destroyed throughout two-thirds of the member. It

was decided in a consultation, consisting of several skilful surgeons, among whom was M. Ribes, that removal of the thigh was the only means of saving the life of the patient. It was immediately performed in the presence of the members of the consultation. I pursued my method, and the operation was terminated in less than four minutes. The flaps were approximated and maintained in their relative situations by several adhesive straps, care being taken, however, not to effect too exact an union. This Russian, who bore the amputation with great fortitude, laboured under no unfavourable symptoms, until the twenty-fifth day. Suppuration was established without difficulty; the ligatures were detached from the seventh to the eleventh day; cicatrization was far advanced, and union had taken place in every part, but the commissures of the flaps, where the ligatures were situated. Means of subsistence failing suddenly in this hospital, in consequence of causes of which I am not aware, our wounded, particularly those who were incapable of leaving the place of their confinement, were subjected to the effects of famine. Their cravings were appeased by eating potatoes, badly cooked, and bulbous plants, or inferior fruits. Their drink consisted only of water, or very indifferent beer, though, previously to my departure, I procured about two hundred bottles of wine, to be administered in a medicinal point of view to those of the wounded, who were in the most dangerous state. My unfortunate and interesting Russian patient became debilitated, and febrile action, accompanied with dysentery, manifested itself. This affection was aggravated, and, progressing with rapidity, caused his strength to be exhausted. He died with many other wounded about the twenty-ninth or thirtieth day after the operation, which would have been completely successful, had not these fatal complications ensued. This report was made to me at Moscow by M. Bachelet, surgeon-major of Witepsk.

This health officer received, some time subsequently, in his hospital, one of our dragoons, upon whose left thigh I had performed the same operation. The wound had completely cicatrized, with the exception of a very small portion, at the time of his entering this city, and the patient also enjoyed good health. He was conveyed farther into

the interior of Poland, and recovered perfectly. I will resume the subject of this amputation at another time. It is evident, however, that it succeeded in two individuals; the first, after being nearly cured, was exposed to famine, became melancholy and miserable, and of necessity perished. I still entertain hopes of discovering the second, whose case may be cited as one of complete recovery after this operation.

A wound, possessed of no less interest, was observed in the person of a Russian soldier, whose forehead was pierced in its centre by a ball, weighing four ounces. This case will be related in the memoir on injuries of the head.

Several partial amputations of the foot were likewise performed; others through the substance of the condyles of the tibia, and at the superior fourth of the thigh, were also executed. The fractures of the inferior extremities, and amputations of the thigh in general, were attended with unfavourable results, in consequence of the patients being unable, by their own efforts, to procure for themselves good food and invigorating drinks among the inhabitants. They sank under the effects of abstinence, and their grievous wounds.

Having established, so far as I was concerned, the duties of the four hospitals, which we had organized in Witepsk, I made my arrangements to depart with the light *ambulances*. The enemy was pursued to Smolensk, a strong city, and advantageously situated on a very elevated promontory, defended by the Dnieper on the side of Russia, and bounded towards our army by lakes and marshes. It was the key to ancient Poland, and could be defended with facility, especially against those who might attack it from the Russian side. About thirty thousand Russians were entrenched in this fortress, and on the neighbouring heights.

In our way to Krasnoe, our advanced guard attacked the rear troops of the enemy. They could not sustain the shock caused by the vigorous assault of our men. Fourteen pieces of cannon, and several banners fell into our possession. We also took many prisoners, among whom were a large number of wounded. I located them together in the synagogue, and immediately dressed their wounds. We had five hundred wounded on our side, nearly all of whom laboured under injuries inflicted by polished weapons. I

left several surgeons in this city, in order to arrange the duties of the hospital, which was there established.

The army soon reached the heights of Smolensk. It was necessary to assault and carry them in succession by the bayonet. The execution of this object, though effected with very great difficulty, in consequence of the position and the tortuous defiles through which it was requisite to pass, was completed in twenty-four hours. I arrived in seasonable time with our *ambulances* for dressing the wounded. The town was attacked and taken by storm on the succeeding day, the eighteenth of August. The enemy made a most vigorous resistance in all quarters; but what could they accomplish, when opposed to the so frequently tested valour and intrepidity of the French? The capture of Smolensk will be regarded, as one of the most glorious exploits of the whole campaign. Several parts of the city and suburbs being fired during the attack, there ensued a conflagration, which was rendered more horrific, in consequence of the greater portion of the houses being built of wood. This accident was favourable to the retreat of the Russians, and the entrance of the French into the town.

The storming of Smolensk was one of the most bloody fights I have ever witnessed. The passages through the gates, breaches, and principal streets were filled with the dead and the dying, nearly all of whom were Russians. The loss of the latter was so immense, that it would have been difficult to compute the large number of killed, who were found successively in the ditches of the city, the ravines of the hills, as well as on the banks of the river and on the bridges. About six thousand of our men were wounded, and twelve hundred killed. The majority received preliminary aid on the field of battle, as soon as they were wounded. I performed numerous operations in the *ambulances* of the advanced guard, whence we removed the wounded with all possible celerity, in order to locate them together in fifteen large buildings, which were converted into hospitals. Several were in the vicinity of the principal points of the field of battle, others in the suburbs, and the largest number in the city.

Our situation here was similar to that at Witepsk, in relation to the deficiency of all kinds of materials for dressing the wounded. It became necessary for me in this, as

in many other instances, to discover substitutes for such means as were wanting. Thus, in lieu of linen, which we had exhausted during the preceding days, I employed the paper found in the building which we converted into an hospital, and which contained the archives of the city. Parchment served the purpose of splints and splint cloths, tow and the down of the birch tree (*betula alba*) were used in the stead of charpee and paper for covering the patients. But, what difficulties was it not necessary to surmount? what toils did we not endure at this conjuncture? Nearly all the inhabitants of the city had abandoned their houses, and the majority of those, which offered any resources, had been a prey to flames and pillage. I was actively aided in all these labours by the surgeons of the *ambulances* attached to headquarters, and by those of the guard. We were occupied, both during the night and day, in dressing those wounds, that were caused by the sword and fire, and notwithstanding the scarcity of means in our possession, every necessary operation was performed in twenty-four hours.

The capture of Smolensk gave rise to numerous cases of wounds, of the most serious and varied nature.

One of the most remarkable of these injuries, was that sustained by a corporal of the thirteenth regiment of the line. A bullet, of large size, shattered the head of the left humerus, the clavicle, and the whole of the scapula. The bony fragments were thrown posteriorly upon the back, and the soft parts abraded and lacerated. The wound presented a very unfavourable aspect. This soldier, in a state of insupportable agony, loudly demanded the removal of the remaining portion of his arm, and the numerous osseous splinters, driven into its muscular parts. Notwithstanding the slight hopes inspired by the situation of this unfortunate individual, I attempted the following operation. After having removed the arm, which was attached to the body merely by some shreds of flesh, and tied the axillary artery, I extracted all the osseous fragments, detached from the muscles and periosteum. The principal disorganized soft parts were then excised, and the lacerated and unequal edges of this extensive wound approximated, and maintained in this state of contiguity by means of adhesive straps and a large piece of linen, dipped in a solution of gum arabic, rendered stimulating by the chloride of sodium. The

dressings were terminated by the application of fine tow, and the scapular bandage. This patient, after experiencing evident relief, was confided to the care of M. Sponville, one of the surgeons-major of the light *ambulances*. I was subsequently informed, that he was removed on the thirty-fifth day from Smolensk to Poland in a state progressing to a cure. I have since had no tidings respecting him; but there is no doubt of this soldier's recovery, provided he escaped other maladies.

I performed, in the first twenty-four hours, eleven amputations of the arm at its articulation with the scapula. Nine of the subjects of these operations completely recovered, previously to our return from Moscow, and two died of dysentery. This extraordinary success justifies the favourable opinion entertained respecting this operation. I also executed several amputations of the thigh, in its superior fourth, with the formation of two flaps. I shall have an opportunity of speaking of this operation, at the conclusion of the campaign.

It was extremely difficult to provide the hospitals with necessaries for the great number of wounded French and Russian patients. The latter were treated indiscriminately with our sick, and received from us the same attention and aid. Brandy, wine, and a large number of highly necessary medicines, were saved from the pillage and conflagration. Persons were despatched into the neighbouring country for cattle and food. Charpee and linen, for dressing wounds, were received from the *ambulances* of reserve. These different resources, and the indefatigable zeal of our surgeons, speedily restored to health the individuals, who were but slightly wounded. Those injuries that partook of a serious nature, were generally in a good state, when, a month subsequent, all means of subsistence suddenly failed, with the exception of flour, which had been received by convoys from the interior. The soldiers, who were not wounded in the inferior extremities, were capable of avoiding the effects of these deprivations; others, however, suffered much in consequence of them.

The urgent necessity of securing the benefits of succour to about ten thousand Russian and French wounded, located in the hospitals of Smolensk, and my persuasion, that the army, after such signal success, and on account of the ap-

proach of the autumnal rains, would make but little progress towards the north, induced me to leave in this city, besides all the surgeons of the reserve, five divisions of our light *ambulances*. I departed with the sixth division, and my two private pupils, in order to repair to Volontina, which is from five to six leagues distant from Smolensk, on the road to Moscow. Our advanced guard, commanded by General Gudin, had in this place engaged in a combat, which was rendered more obstinate by the fact of the rear-guard of the enemy having taken a position on a chain of small mountains, bordering on the right bank of the Dnieper, and extending, contrary to its course, parallel to the city of Smolensk and the adjacent hills. I caused the wounded of this battle to be dressed. General Gudin was among this number; but I arrived at too late a period for the performance of the operation, necessitated by his wounds. One of his legs had been carried away by a cannon-ball, and the calf of the other totally removed. Symptoms of very violent inflammation, were promptly developed in the two limbs. Irritation and gangrene were speedily manifested in the seat of injury, and death terminated, on the third day, the sufferings of this worthy and valiant general, who had carried, at the point of the bayonet, the almost impregnable position, on the mountain of Volontina, though it was defended by the grenadiers of the imperial Russian guard. The defile of this mountain was found crowded with the dead of this troop of *élite*. Our killed were in the proportion of one to four of the enemy. Doubtless this novel success, or the hope of fighting speedily a dernier and decisive battle, led Napoleon to pursue the enemy in their retreat towards Moscow. With the view of enabling myself to rejoin him, I hastily dressed the wounded in the last battle, amounting to from six to seven hundred men, with whom it became necessary for me to leave my sixth division of light *ambulance*; the latter returned with them to Smolensk. There remained with me but two assistants, and it was impossible for us to overtake the head-quarters of the army, until they arrived at Dorogobouje, the first station. After having passed this city, and the chain of mountains before it, the Dnieper was re-crossed for the last time, and the immense plains, which comprise the greater part of Russia proper, were discovered. At the entrance

into these plains, and on the bank of the river, there were remarked several small mounds of earth, pyramidal in form, which the inhabitants of a neighbouring village informed us, were the tombs of those who were killed in a bloody battle, fought in former times between the Russians and Poles. M. Baron Percy has described, in a very learned memoir read before the Institute, similar monuments, which he observed in different countries of Germany. The sight of these tombs made a sad impression on my feelings. Indeed, was it not calculated to awaken sombre thoughts in the minds of men, so remote from their country, at a period, when the rainy season was about to commence, (the first indication of winter in this climate,) and when it was to be apprehended, that the bad condition of the roads would expose the army to many dangers, as we had already experienced at Pultousk? (*See the first campaign in Poland.*) The roads in Russia, which are of immense breadth, are neither paved, nor kept in repair. These plains, which extend beyond Moscow, are covered with abundant crops in summer, and with snow, of greater or less depth, in winter.

We had scarcely crossed the last branch of the Dnieper at Dorogobouje, when I suddenly experienced all the symptoms of sea-sickness, such as frequent nausea, yawning, a sensation of being stunned, or vertigo, and vomiting. It appeared to me, that I saw, at the immeasurable limits of the horizon a scintillation or trembling of the earth, which had an effect on my senses, similar to that caused by the tossing of a vessel at sea. This illusion or these sensations were increased, when I walked,—diminished, when I was mounted on my horse, and almost totally disappeared, when I lay in a horizontal posture. The latter was the most favourable position I could adopt. I laboured under this indisposition, until my return to Smolensk. From what could it have originated? Was it an optical illusion, or an excess of sensibility in my organs which received a deranged impression from the constant motion of the large bodies of individuals and objects, by which I was continually surrounded, on these immense plains?

In our passage through Dorogobouje, we found those houses, that could have offered us resources, to be in flames. The rapid progress of the conflagration obliged us to bi-

vouac. The Russian soldiers had set fire to the city, which was deserted by all of its inhabitants.

Here commenced every species of privation. This lamentable prelude should have warned us of the calamities, we were destined to endure on the remainder of our route to Moscow. Led on by irresistible inducements, and flattered with the vain hopes of peace, we continued our march. We shortly after attacked Viasma, a considerable city, which served as a depot for the commerce of the two Russias. It contained immense store-houses of oil, brandy, soap, sugar, coffee and furs. We found it almost entirely consumed. It was with great difficulty, that the army traversed it, and in consequence of the violence of the winds it was impossible to arrest the progress of the flames. The inhabitants had also abandoned the city, and our sufferings in the midst of this desolation may be conceived. The soldiers however collected from some houses, that had escaped the flames, and even in the cellars of those that had been burnt, a quantity of flour, oil, brandy, sugar and coffee.

From Viasma, we moved on hastily to Giad, a city of less importance, and built almost entirely of wood. It contained but one street, of very great length. We passed through it, as through the two preceding cities, in the midst of flames. Abundant showers of rain, which supervened on our arrival in this place, arrested the conflagration, and permitted the general officers and guard to take up their quarters in those houses, that had been preserved. The fields in the vicinity of this city abounded in large-headed cabbages, which, together with the bacon and biscuit found in a store-house, proved highly serviceable. Our soldiers enjoyed a momentary satiety on this food.

The rains, by their long duration, had rendered the roads impassable by the artillery. The army was necessitated to arrest their march about Giad, with the view of awaiting fair weather, which no one expected with any certainty. We were, however, greatly and agreeably surprised by the sudden change of the winds to the north north-east, and dry weather ensued. During this interval information was received, that the Russian army had finally taken a position on the heights of Mosaisk and in the neighbourhood of the Moscowa, and were strongly entrenched

in this situation. Preparations for a grand battle were ordered to be made, and notice was given me by the commander-in-chief to make my arrangements accordingly.

I was much affected by this intelligence, in consequence of my surgeons having remained at Smolensk, and the *ambulance* waggons being still in the rear. For the purpose of supplying my deficiency in this respect, I solicited an order of the day, which placed at my disposal all the surgeons of the regiments, the surgeon-major, an assistant and sub-assistant being excepted, for the corps of infantry, and a surgeon-major and sub-assistant for the cavalry. This proceeding procured me forty-five surgeons, assistants or sub-assistants, whom I attached to head-quarters.

A prolongation of our sojourn at Giad for twenty-four hours, gave opportunity to several of our *ambulance* waggons to rejoin us; and I was fortunate, notwithstanding the remoteness of the reserve, in being capable of furnishing the requisite succour in the battle which was about to take place.

PART THE SECOND.

AFTER a march of thirty-six hours, we found ourselves in the presence of the Russian army. It was stationed and entrenched on the top of a circular hill, extending from Calouga and the grand road to Moscow on our left, to the distant forests on our right. At the base of the hill, there ran a deep stream, difficult to be forded, and giving this position immunity from an attack.

The want of sustenance and forage, particularly of oats, had nearly reduced both soldiers and horses to a state of exhaustion. Arriving on the field of battle, the army was destitute of every species of food. There was even a great scarcity of water, which it was necessary to obtain from the above mentioned stream in the very face of the enemy. Giad and the abbey of Kolloskoi, in the vicinity of the field of battle, were almost totally devoid of any resources. On our departure, the flames broke out anew in Giad, which was deserted by all of its inhabitants without exception.

The conflagration, supported by the violence of the winds, reduced the city to ashes in a few hours. The churches and three or four brick houses were all that remained undestroyed. They were used by us as hospitals, in which I was necessitated to leave some of my surgeons.

The troops of our advanced guard in the mean time displayed their ranks and attacked, September the fifth, at two o'clock, P. M. the first line of the enemy, which fell back on the second. Some redoubts were carried by our cannon. The enemy's forces were giving way in all quarters and every thing indicated a glorious issue for our arms, when the combatants were suddenly surrounded by the shadows of night, and both parties forced to interrupt the fight and resume their respective positions.

I caused our wounded to be dressed during the night,

and removed immediately to the abbey of Kolloeskoi, where the general *ambulance* of retreat had been established.

The day of the sixth was spent in recruiting the troops, and in a strict reconnoitring of the enemy's lines. I availed myself of this opportunity to have dressings prepared, and placed on duty thirty-six surgeons, who were under my immediate control. All the materials of the *ambulances* were likewise arranged by my direction. The positions to be occupied by the *ambulance* of head-quarters and the guard were designated by Napoleon himself. Previously to repairing to this bivouac, I passed through the whole line, for the purpose of giving my instructions to the officers, who presided over the *ambulances* of the corps and divisions.

A proclamation was issued during the night intervening the sixth and seventh of September. (*See the bulletin of the army.*)

Accompanied by the *ambulances*, I proceeded, before the dawn of day, to the appointed place. It was a square space of about three thousand feet in circumference, situated in the centre of the line and in the vicinity of the tents of head-quarters. The battle commenced by a general attack at the rising of the sun. Prince Eugene commanded the left wing, Prince Poniatowski the right, and Prince Murat the centre, in which situation were stationed the corps of the guard and the Emperor.

Upwards of two thousand pieces of artillery, appertaining to the two armies, were simultaneously discharged. Our battalions advanced boldly across the enemy's fire, in order to seize upon the first redoubts and break through their lines. The left wing routed a column, which defended one of the strongest positions on the road to Moscow, and advanced hastily on Mosaisk. The centre, under the immediate command of Marshal Ney, after standing a very brisk fire from the numerous batteries and redoubts, which defended the most important part of the enemy's line, carried these fortifications, and made itself master of this formidable and almost inaccessible position.

General Caulaincourt, commander of the assaulting column, was killed on the first redoubt. The Generals Morand and Lausnaberg, who succeeded him in command, were wounded on the same spot. The latter died a few days

after the reception of his wound, which was caused by the passage of a ball through his abdomen, and involved the intestines. The loss of these officers retarded the progress of this column, and it was with some difficulty that these troops retained possession of the redoubts and position. Prince Poniatowski marched with an equal degree of boldness on the ranks of the enemy, to which he was opposed, and attacked them with similar success. Their whole line tottered, and their first position was carried. They would doubtless have been totally destroyed, had the reserve been capable of aiding the central column, or the space occupied by the infantry and cavalry, already very much fatigued, been less extensive; and in short had not the day been so far spent. It was for some moments doubtful, which party would prove victorious. Our battalions however closed up, and, animated by a new impulse, moved on with rapidity, and possessed themselves of the whole field of battle, vigorously driving the Russian army before them. The bold resistance made by the latter proved fatal to many, and the remainder of the troops precipitately retreated to Moscow. They made no halt in this place, but continued their march hence to Calouga. This bloody battle continued from six o'clock, A. M. to nine o'clock, P. M. We had forty generals killed and wounded, and from about twelve to thirteen thousand men, both officers and soldiers, placed *hors de combat*. The number of wounded amounted to nine thousand five hundred. The loss of the enemy was estimated at upwards of twenty thousand. It would be difficult to describe the scenes of horror presented during this dreadful fight, in which more than from five to six hundred thousand combatants were engaged in a space of about a league square.

Two-thirds of the above mentioned wounded were located in our general *ambulance*, the whole army being made aware of its position by the order of the day, and its vicinity to the tents of head-quarters.

I had scarcely made the necessary preparations, when the wounded arrived in a crowd, and much confusion would have ensued, had I not pursued the order of dressing and arrangement, observed by me in all battles, and detailed under its principal heads in my first campaigns. I owe much praise and many thanks to my estimable assistants,

to M. Laubert, chief pharmaceutist of the army, and to several of his juniors, for the zeal with which they aided me in this memorable battle.

The limited number of my assistants, high in rank, forced me to perform personally all the difficult operations. It was also necessary, that I should exercise an active supervision over this *ambulance*, and all those of the line.

Two or three hours had elapsed since the commencement of the battle, when I was called to the assistance of General Montbrun, commander of one of the cavalry corps, who was mortally wounded. It was requisite that his wound should be dressed on the spot where it was received. The loins were traversed, from side to side, by the projectile. Little could be done, death was certain, and not far distant. I applied dressings, and caused this general to be conveyed to a small village in the vicinity, where he died a few hours subsequently. During the dressing of this wound, my situation was one of very great peril, some horses, which were behind us, being killed by a ball. I returned to my *ambulance*, to which I was recalled for the purpose of bestowing my services on the Generals Nansouty, Lausnaberg, and Romeuf. The first had the internal side of the right knee traversed by a ball, which fortunately had not injured the articulation. I laid open the wounds, applied a suitable dressing, and placed the patient under the charge of chief-surgeon Bancel, who attended him, until he was perfectly cured. I have already made known the wound of the second. It presented no other indication than that of a simple dressing and subsequent care, which was prodigally bestowed upon him with the greatest zeal, but unhappily proved unavailing. Being unable to fall in with the latter of these generals, I did not see him until the succeeding day. He had been dressed on the field of battle, and conveyed to the same village to which General Montbrun had been carried. The very great injury, caused by a spent ball, in the right hip and lumbar region of the same side without any exterior mark, was not recognized. A long incision, made immediately in the skin of this region, which was disorganized and distended by a large quantity of extravasated blood, revealed to me the whole extent of the interior disorder. The muscles were lacerated and reduced to the consistence of jelly,

and the *os innominatum* and corresponding lumbar vertebræ fractured. The commotion, which the abdominal viscera must have experienced, may be imagined. General Rommeuf died on the same night. It were impossible to exhibit more valour and courage, than was displayed by these noble sufferers, whose names deserve to be recorded in the annals of history.

I speedily returned to the general *ambulance*, where I continued, without intermission, the performance of difficult operations, until late in the night of the following day. Our duties were rendered proportionally more laborious by the very cold and frequently cloudy weather. The north, north-east, or north-west, winds, which prevailed constantly during the whole month, were very violent, in consequence of the approach of the equinox. It was with great difficulty, that a wax taper was kept burning before me during the night. I had no absolute need of it, but for the application of ligatures to arteries.

The surgeons, without exception, gave the most signal proofs of courage and devotion in this battle. The *ambulances* of the corps, and those of the regiments were at their posts, and perfectly fulfilled their duties.

Two only of the individuals, upon whom I performed the operation of amputation at the shoulder joint during the first day, died during the removals, as I was subsequently informed. The others arrived cured in Prussia and Germany, previously to our return to those countries. The most remarkable of those wounded individuals was a chief of battalion, attached to one of the regiments of infantry of the line. Immediately after the operation had been performed, he commenced his journey, mounted on his horse, which he speedily lost. This circumstance did not impede his progress; he pursued his way, uninterruptedly to France, where he arrived cured three months and a half after he received the wound.*

I was much occupied with the execution of another de-

* This officer daily sponged his dressings, which were not renewed until his arrival at Paris. This shoulder was afterwards covered with a sheep-skin.

licate operation. My allusion has reference to amputation of the thigh with a flap.

This member was found disorganized in the persons of many soldiers of all classes, sufficiently high up to prevent the performance of the circular amputation, and yet not disorganized to such a degree as to render necessary the extirpation of the limb. I was obliged, in every case, to amputate on a level with the great trochanter, and at a very short distance from this apophysis. I have elsewhere pointed out the manner of performing this operation.

There was, however, among the wounded a sub-officer of dragoons, whose injury necessitated a removal of the thigh. A bullet had traversed this member from the external side of the fold of the groin to the great trochanter. The muscles along the whole tract of the projectile were destroyed, and the bone shattered as high up as the hip joint. The crural artery, however, though very contiguous to the wound, was not injured. The patient lost little blood, and no serious symptom as respects the internal organs, presented itself. His condition, in short, was highly favourable (the local disorder being excepted) to the operation, which I undertook, though on the field of battle, with a greater degree of boldness, inasmuch as the patient requested its immediate performance. The internal flaps had already been formed by the course of the wound; it was merely smaller than it would have been, had it been made of uninjured parts. The pectineus muscle being separated from it, I left it in its situation, and, without removing his portion of the soft parts, cut under this muscle the inter-articular ligament, which retained a part of the head of the bone in its cavity. The operation was terminated in the ordinary manner. Having applied the ligatures, I approximated the two flaps, and maintained them in their relative position by adhesive straps and suitable dressings. This patient was then conveyed to the abbey of Kolloeskoi, whence he was successively removed to Witepsk and Orcha. The surgeon-major, who received him in the latter city, informed me by letter, that this sub-officer had recovered perfectly from the operation. I know not what has since become of him.

If gunshot wounds of the thigh, accompanied with fracture of the os femoris, in general render necessary the am-

putation of the limb, there is an injury of this character, which strongly demands this operation, or else the patient is doomed to perish, after having endured excruciating torture. Little is known about it, and indeed it is one of those wounds, which appear the most favourable to the preservation of the limb, since it does not indicate, by any exterior mark, the danger which accompanies it.

A ball, with all the violence of its impulse, pierces the thigh, in an antero-posterior direction, immediately above the patella. This projectile traverses the limb throughout, or is arrested in the popliteal fossa, according to the resistance it experiences from the bone. In both cases, the femur is broken transversely above the condyles, and the two apophyses are separated from each other by a vertical fracture, which extends into the joint. The patient loses his equilibrium, and falling immediately aggravates the internal injury. The series of unfavourable symptoms, which are developed, and the necessary termination of such a wound, may be easily imagined. It is, moreover, quite difficult to recognize the seriousness of this lesion. Should the ball have terminated its course without effecting a rupture of the popliteal artery, the two wounds, at first sight, present nothing serious in their nature. There is scarcely any or no displacement of the bony fragments, and the patient suffers little during the first hours succeeding the accident.

But tumefaction soon supervenes, and renders farther examination impracticable. Thus, on one hand, a surgeon is led to believe, that the wound is not of so serious a character, as to require amputation of the limb; and, on the other, the nature of the cause, which produces these consecutive symptoms, is not known. This circumstance may doubtless have frequently led practitioners into error, and I have been myself deceived, in cases of individuals labouring under this kind of wound, whom I hoped to be capable of curing without an operation. Experience has taught me to decide, in a precise manner, upon those cases of gunshot wounds of the thigh, accompanied by fracture or a shattered condition of the femur, in which amputation is indispensable, and those in which an attempt may be made to preserve the limb by the ordinary means. In order that we may be able to treat fully this question, we will give an

account of our observations on this point in the battle of the Moskowa.

The first wound of this character, which presented itself in this battle, the seriousness of which I was so fortunate as to discover, was observed in the person of Count Sackovensk, colonel of the regiment of cuirassiers, belonging to the Russian imperial guard, an officer of very fine appearance, strong constitution, and considerable embonpoint. This soldier, of superior rank, was brought to the general *ambulance*. He had been wounded by a ball above the left knee. This projectile, after having fractured the femur above the condyles, was arrested under the skin of the ham, from which it was extracted by our chief-surgeon, M. Bancel, who was making arrangements for the application of a fracture apparatus to the injured thigh. I was called, in the mean time, for the purpose of examining the wound, which, at first sight, did not appear to be of an unfavourable nature. A very careful examination revealed to me, besides the complete fracture of the inferior extremity of the bone, the separation of the two condyles by a vertical division, which appeared to communicate with the articulation. I did not hesitate to propose the amputation of the limb. The surgeons present did not approve of it, and the patient was not decided on this point. But after some moments of reflection he consented, and requested me to operate on him immediately. I performed the circular amputation above the seat of injury. My method was conformable to the rules pointed out in several articles of my *Campaigns*. The patient was removed from our *ambulance*, and conveyed with other prisoners to a neighbouring village. The objections which were raised against the operation, led me to have the detached limb immediately dissected. The bone was divided, at its union with the condyles, by a transverse fracture, and the two apophyses separated in a vertical direction. The articulation was filled with black albuminous blood, the popliteal artery lacerated, and the muscles of the leg in a state of engorgement. It is indeed difficult to meet with a case, which demands more imperiously the operation of amputation. We will again speak of this patient on our return from Moscow. Three cases nearly similar presented themselves in this battle. The same phenomena were observed

in the examination of the amputated limbs, which was conducted by one of my pupils.

I have preserved the knee in many instances of wounds, in which the leg has been carried away, or disorganized by a bullet at a point so contiguous to this articulation, as to have induced me to perform amputation of the thigh, had not experience demonstrated to me the success of the operation executed through the substance of the head of the tibia. The advantages of this latter amputation have never been more appreciated by patients than in these adverse situations. Many indeed among them, who were capable of manufacturing for themselves wooden legs, were so fortunate, though they were very awkwardly made, as to avoid the painful vicissitudes, which were experienced until our return from Moscow by those whose thighs had been amputated in the *ambulances*. They were also enabled to guard themselves against the severe cold, which destroyed the majority of the wounded, who were incapable of walking, and especially those, who were transported in the rear of the army. I will briefly relate the case of amputation near the knee, which I consider as most worthy of remark.

A young Russian officer, belonging to the regiment of the colonel above mentioned, was wounded in the calf of the right leg by a small mortar. One of the projectiles, contained in the latter, escaping from it at the time of its passage through the substance of the limb, was driven into the hollow of the ham, ascended the thigh, following the course of the popliteal vessels, and issued externally at the middle and internal part of the limb. The calf of the leg was totally removed, and the two bones shattered very high up and near the knee.

Although the joint was not injured, none of the surgeons present supposed it possible to preserve the knee. One of them indeed was making arrangements for amputating the thigh, when the Russian colonel, who spoke the French language, directed that I should be sent for.

After having made a strict examination of the wound throughout, I proceeded to amputate the leg through the head of the tibia, above the level of the tuberosity for the insertion of the patella. Previously to sawing through the tibia, I dislocated the fibula. The head of the bone

was sound. I was capable of preserving merely a small part of the integuments, for the purpose of affording a covering to the anterior half of these divided eminences. The integuments of the ham had been removed, as high up as the thigh. A ligature was placed around the popliteal artery at the point of its bifurcation. I laid open the wound of the thigh, and established a communication between it and that of the stump, by means of a strip of linen, recommending the extraction of the latter, when suppuration was established. The application of a piece of fine linen, and the ordinary apparatus, terminated the dressing of the wound. This patient was conveyed with the colonel, Prince Gallizin, who was slightly wounded, and other Russian officers, to a neighbouring village, in which they remained until their recovery.

The wounds, received in this battle, were generally of a serious nature, in consequence of nearly all of them being caused by artillery, and by musketry, inflicted at the very extremity of the guns, or at least very nearly so. The balls of the Russians, moreover, as we have frequently remarked, are larger than those used by our soldiers.

A large number of wounds, caused by artillery, required amputation of one or two limbs. I performed, in the first twenty-four hours, about two hundred operations of this character. The most favourable results would have succeeded, had not our wounded been destitute of an asylum, of straw for their beds, bed-clothes, and sustenance. But such was our unfortunate situation, and we were, moreover, very remote from those places which could have furnished us these succours.

The absence of means, necessary for transportation, rendered it necessary, that we should dispose of our sick in all the neighbouring villages, comprising the abbey of Kolloskoi, in which the majority were located. The stay of the cavalry in the limited range of places occupied by our wounded, had occasioned the consumption of all kinds of forage, and it was with difficulty that we were enabled to obtain a sufficient quantity of straw to make beds for them during the first days.

The small quantity of bread and flour in our possession was soon consumed. Our wounded were reduced to the necessity of eating the flesh of the horse, potatoes, and the stocks of cabbage. The latter, together with the flesh of

this animal, were used for some time for the purpose of making soup. This aliment was soon exhausted, and the march of our convoys was rendered more difficult, in consequence of the roads being infested with Cossacks.

Charpee and linen for dressings were wanting equally in almost every situation. Many articles of primary necessity, such as bread, flour, beer, medicines, and linen, might however have been obtained from several places, in which we found succours. Agreeably to my request, orders were given, by the superior officers of the army, to take advantage of this opportunity. But the execution of such measures ordinarily depends on too many individuals, and, as a consequence, must meet with great difficulties. The opportunity was suffered to pass by, and the wounded did not receive the succour, to which they were entitled. The surgeons, the only consolers of these unfortunate men, were forced to wash personally, or cause to be washed in their presence, the linen, which had already served as dressings, in order that they might be daily renewed. It is to the indefatigable zeal and industry of my assistants, that the majority of the wounded are indebted for their preservation.

The army marched, on the day after the battle, in pursuit of the Russians, who did not deem it proper to halt at Mosaisk, where, however, they had an advantageous position.

I delayed my departure three days, with the view of having the dressing of our wounded completed, and also of attending to the Russians, who were successively removed from the field of battle, and conveyed to our *ambulances*.

On entering Mosaisk, we found several quarters of the city on fire. All the inhabitants had abandoned it, and the principal houses were filled with the wounded Russians, who were incapable of following the army, and were left without any kind of succour. Nearly all of these unfortunate individuals had their limbs mutilated, and were consequently unable to procure sustenance by their own exertions. If their wounds be excepted, they suffered most acutely from burning thirst. This affection appears to me to have contributed a great deal to the death of a large number of these ill-fated soldiers, whose bodies were permitted to lie for a time in the midst of the living. Ten

of these patients had each lost a limb by amputation, performed by the Russian surgeons. The first two had had their arms extirpated at the shoulder joint. Two large flaps had been formed, a superior or scapular, and an inferior or axillary. Several ligatures passed through the substance of the latter, for the purpose of embracing the axillary artery, and the two flaps were maintained in their relative situation by several points of suture. In the case of one of these two wounded individuals, the stump became very much tumefied; irritation and gangrene were developed on the same day, and the patient died on the following, notwithstanding the precaution, adopted by me, to cut the ligatures. We found the second patient expiring in consequence of the haemorrhage, which supervened a very short time after the extirpation of the limb. He had been operated upon according to the same method, and it appeared that all the arteries had not been tied. As in the former case, however, the union of the flaps was exact, and the points of suture even more multiplied. I have not learned any thing, as to the fate of the remainder of these patients, upon whom amputation had been performed.

Assisted by some soldiers of the guard, whose humanity I frequently put to the test, I provided, in the first place, for the most urgent necessities of these unfortunate persons. Water and biscuit, which I discovered in a storehouse, were distributed to them by my direction. I then caused the dead to be removed. All the wounded, who had not been dressed, had this attention immediately paid to them. The churches and public house were placed in a proper condition for the reception of the wounded French. The Russians were located in the houses of merchants, and I left with them the few surgeons that remained with me, under the supervision of a chief-surgeon, preferring to await the successive arrival of those who were in the rear.

Having remained two days at Mosaisk, head-quarters moved on to Moscow. We were scarcely distant some miles from Mosaisk, when we were much astonished at finding ourselves, notwithstanding our vicinity to one of the largest capitals in the world, in a sandy, arid, and completely desert plain. The sad aspect of this solitude, which discouraged our soldiers, appeared to presage the entire de-

sertion of Moscow and the misfortunes that awaited us in this city, the splendour of which should have promised us another fate.

The army traversed this plain with difficulty. The horses were fatigued and exhausted by famine and thirst, for there was as great a scarcity of water, as forage. The soldiers endured many hardships, and were overcome with fatigue, and deprived of sustenance. A long time had elapsed, since a distribution was made to the troops, and the few resources found in Mosaisk merely served for the junior and elder guard. A large number of conscripts of the former corps became victims to the abuse of *chenaps*, (the brandy of the country.) They were observed to remove themselves some steps from their companions, to stagger, turn round, and then to fall upon their knees, or sit down involuntarily. They remained motionless in this position, and soon expired, without giving utterance to a single groan. These young soldiers were predisposed to the pernicious effects of this drink, by ennui, privations, and excessive fatigue.

We reached, on the evening of the fourteenth of September, the suburbs of Moscow, and there learned, that the Russian army, in its passagé through that city, had taken along with it all the citizens and public functionaries. There merely remained in the city, some of the inferior order of the people, and those who acted in the capacity of servants; so that, in passing through the principal streets of this grand city, which we entered on the morning of the following day, we scarcely met any one. All the houses were totally abandoned, but we were very much surprised at seeing several remote quarters of the city on fire, whither our soldiers had not yet repaired, and especially the bazar of the Kremlin,* a very extensive building, ornamented with porticoes, which bear some resemblance to those of the Palais Royal in Paris.

When comparing the city of Moscow with what we had witnessed in our march through Russia minor, we were much astonished at its grandeur, its numerous churches and palaces, the splendid architecture of its edifices, the commo-

* Palace of the Czars.

dious arrangement of its principal houses, the richness of their furniture, and the objects of luxury, observed in the greater part of it. The streets generally were spacious, regular, and well paved.

There appeared nothing in this city which was discordant with its general character. Every thing indicated its opulence, and very extensive trade in the products of the four quarters of the globe.

The varied construction of the palaces, houses, and churches, added infinitely to the beauty of the city. There were portions of it, which, by the kind of architecture of the different houses, signified by what nations they were generally inhabited. Thus, the quarter occupied by the Franks, was easily distinguished, and that of the Chinese or Indians, and Germans, known without difficulty. The Kremlin may be considered as the citadel of Moscow. It is situated in the centre of the city on an elevated piece of ground, surrounded by a wall with battlements, and defended, at intervals, by towers armed with cannon. The bazar, to which we have alluded, ordinarily filled with the merchandise of India and precious furs, had become a prey to the flames. No relief could be obtained, but from those articles, which were stored away in the cellars. Into these vaults our soldiers penetrated after the conflagration, which consumed nearly the whole exterior of this splendid edifice. The palace of the emperors, that of the senate, the archives, arsenal, and two very ancient temples, occupied the remaining part of the Kremlin. These different structures of rich architecture, presented a majestic appearance around the arsenal. An individual would imagine himself transported to the public square of ancient Athens, admiring in the one, the Areopagus and temple of Minerva, in the other, the academy and arsenal. Between the two temples there arose a cylindrical tower, in the form of a column, and designated by the name of the tower of Yvan. It was, properly speaking, an Egyptian minaret, in the interior of which were suspended several bells of varied grandeur. At the base of this tower, one was observed of immense size, to which allusion is made by all historians. The whole city, and its environs, were seen from this elevation; its delineations resembled a star with four bifurcated branches. The variety of colour in the roofs of the

houses, the gold and silver, which covered the domes and chapiters of the numerous steeples, gave to this city the most picturesque appearance. Nothing could equal in splendour one of the temples or churches of the Kremlin. It was the tomb of the emperors. Its walls were overlaid with plates of gold or silver, gilt from five to six lines in thickness, on which were represented in relief the history of the Old and New Testament. The candlesticks and chandeliers of massive silver were particularly remarkable for their extraordinary size.

The hospitals, which attracted my especial attention, were not unworthy of the most civilized nation of the world. I divide them into military hospitals and civil monkish institutions. The great military hospital consisted of three parts, forming together a parallelogram. The principal portion of it was built on the edge of a large road, in front of immense barracks, which may be compared to the royal military school at Paris. Two lateral buildings, constituting right angles with the former, completed the enclosure of the court, which communicated with a beautiful and large garden, the latter serving as a promenade for the sick. A portico, with columns, formed the front of this building, the height of which was two stories. The entrance led first into a spacious vestibule; into this opened the doors, conducting to the apartments of the basement story. A large and magnificent staircase, leading to the upper stories, was also here situated. The halls occupied the whole length of the building, and were provided with windows, on each side, extending almost from the floor to the ceiling, and consisting of double sashes, as is the case throughout Russia. They were perfectly closed during the winter. Stoves, with impressions upon them, were placed in the interior of these apartments, at suitable distances. There were four rows of similar beds, at such distances from each other, as was requisite for the preservation of health. Each row consisted of fifty beds, the total number of which may have amounted to more than three thousand, the three buildings forming the hospital containing fourteen principal halls, of nearly the same extent. The manufactory, medicine, and cooking apartments, and the accessories of this hospital, occupied very distinct and convenient situations, a short

distance from the halls. This building was one of the best constructed, largest, and most beautiful I have ever seen. We found in it but a very small number of patients, who were removed to the second hospital, which was less extensive, and situated in the vicinity of an establishment, called Institutes, devoted to the education of the male and female children of those who had been killed in battle.

The civil monkish institutions, which it was my duty to visit, for the purpose of locating our wounded in them, are equally worthy of attention.

The four principal were the hospital of Chieremetow, that of Gallizin, the hospital of Alexander, and that of the Foundlings.

The first, remarkable on account of its shape, its construction and internal arrangements, was pitched upon for the reception of the wounded and sick of the guard.

This hospital, consisting of three stories, was built in the form of a crescent. Its accessories were situated in the rear of this edifice. A beautiful portico, just in the centre of this half moon, formed the entrance into a chapel, which occupied the middle of the building. This chapel, surmounted by a dome, and surrounded by the principal halls, designed for the sick, contained the mausoleum of the prince who founded this hospital. It was ornamented with stuccoed columns, statues, and beautiful pictures. The apartment, in which the medicines were deposited, was one of the handsomest and most splendid with which I am acquainted. The rooms, to which access was gained by means of galleries, differed as respects size. The beds and other movables, were kept in very neat order. We found here twenty old men belonging to the household of the prince, whom we placed by themselves in one of the best quarters of the hospital, in order that they might not be situated in the midst of our sick. The same succour was administered to them and to our soldiers.

The Hospital of Gallizin, situated at the opposite extremity of the city, was the most beautiful in Moscow. In it were located the wounded French officers. Our attention was bestowed in an equal degree on thirty Russian officers, who were labouring under serious wounds, and were placed in this hospital by their companions on their departure from Moscow. Three of them had undergone amputation;

two, that of the leg, and the other, that of the thigh. The latter died, during our stay here, of fever arising from the irritation of a conical stump. The wounds of the two amputated legs had been seized with hospital gangrene, when I first saw them. One of the patients succumbed to this affection; but a favourable change took place in the other individual, and he recovered. The gangrene which we were fortunately enabled to arrest in proper time, destroyed the flap, formed of the calf of the leg by the Russian surgeon in the operation. From this period the wounds became regular, and cicatrization was effected, though indeed slowly. Several other Russian officers laboured under very extensive comminuted fractures, accompanied with disorganization of the soft parts. I had much difficulty in persuading them of the necessity of amputation. Two of them, however, decided upon its performance. It was the cause of their preservation, and they were cured in a very short space of time.

Two French officers, attached to the Polish corps commanded by Prince Poniatowski, were brought from the advanced guard to this hospital. Both of them had received, in one of the battles in which these troops were engaged, wounds of so serious a nature as to necessitate amputation of the limb. It was performed, in one case, upon the thigh, and in the other, on the leg. The chief Polish surgeon, M. La Fontaine, author of a work on *Plica*, executed these two operations. He attempted the union of the two wounds by the first intention, and maintained their edges together by means of several points of the interrupted suture. One of these officers laboured under considerable haemorrhage on entering the hospital, and the stump was already seized with gangrene. I immediately divided the sutures, and found the stump filled with coagulated blood. There was no ligature whatever; but haemorrhagy did not again supervene, and the patient experienced some relief. Gangrene, however, was not less tardy in its progress, and at the expiration of a few hours the patient was no longer in existence.

The other was in a state of violent irritation, which I was incapable of allaying by any known means. The suture had likewise been employed in this instance. The latter was divided, and emollients applied to the whole of the affected member. We entertained hopes of his recov-

very for a short period; but gangrene developed itself, and progressed with alarming rapidity. It soon extended to the thigh, which it speedily seized upon, and the patient died in twenty-four hours. This is the second opportunity I have had of witnessing this mode of amputating. I shall have occasion to speak of it again.

The Hospital of Foundlings, situated on the edge of the Moscowa, and protected by the cannon of the Kremlin, was undoubtedly the most extensive and most beautiful establishment of this kind in Europe. It consisted of two buildings; the first, in which was the door of entrance, was designed for the residence of the governor, chosen from among the old army generals, and for that of the government officers, the surgeons, and all the individuals connected with the duties of the hospital, as well as for the location of the offices of the institution. The second building was a perfect square. In the middle of the court, which was very large, there were a fountain and reservoir distributing the water of the river throughout the hospital. It consisted on all sides of four lofty stories, around which ran a regular corridor, of little width, but sufficiently spacious for the free circulation of air, and passage of persons through it. The rooms occupied the remaining breadth and entire length of the wings of the building. In each apartment, there were two rows of beds, provided with curtains, their size being proportional to that of the children. The quarter of the building in which the boys resided, was separated from that occupied by the females. The greatest degree of neatness and order reigned throughout this establishment.

It should be remarked, that the former building and the greater part of the rooms in the second, were arched, and constructed in such a manner, as to be proof against the flames. The manufactories, and all the accessories of this institution generally, were in the highest state of improvement.

The Russians, in their retreat from this city, took with them all the children of both sexes, who were beyond the age of seven years, and there merely remained a small number of the younger class. These were located together in a distinct portion of the hospital, and the remainder of the building was arranged for the reception of the French patients whom it was not possible to transport. This asylum

was selected under the intimate persuasion that it would command greater respect from the Cossacks, in the event of a precipitate retreat of our army.

We had scarcely possessed ourselves of the city, and extinguished by our exertions the flames lighted up in its most beautiful quarters, when, in consequence of two more powerful causes, the conflagration was renewed in a more violent manner, was propagated with rapidity from one section of the city to another, and totally destroyed it. The first of these causes was justly attributed to the evident voluntary acts of a certain class of Russians, who were said to have been confined in the prisons, the doors of which were opened on the departure of the Russian army. These wretched individuals, excited to the deed either by orders from a superior source, or influenced by their own desires, and having in view doubtless the pillage of the city, went from palace to palace, in the eyes of every body, and from house to house, for the purpose of setting fire to them. The French patrols, though numerous and frequent, could not prevent the execution of their purposes. I saw several of these persons taken in the act of perpetrating their schemes; they held in their hands lighted matches and combustible materials. Death, which was inflicted on those who were caught in this flagrant offence, had no effect on the rest, and the conflagration raged incessantly* for three days and three nights. It was without avail, that our soldiers pulled down houses with the view of arresting it. The flames soon spread beyond these intervals, and, in a moment, the buildings thus isolated were wrapped in this destructive element. The second cause of the renewal of this conflagration may be found in the impetuosity of the equinoctial winds, which are constantly very violent in these countries. By their influence the fire increased, and spread with extraordinary rapidity.

* One of these incendiaries entered the palace occupied by General Grouchy, and, with a lighted torch in his hand, was proceeding to set fire to the house, by applying the flame to the curtains of his bed, when the son of this general, (who related to me the occurrence,) leaped suddenly on the miscreant, and, assisted by his servants, succeeded in conveying him to the door, where he was arrested by a French patrol, and conducted to the tribunal, instituted against these incendiaries.

It were difficult, under any circumstances whatever, to present to the eye a more horrific spectacle than that, which it was so melancholy to behold. It was particularly during the night between the eighteenth and nineteenth of September, a period at which the flames were at their height, that it exhibited an astonishing appearance. The weather was fine and dry, and the winds blew without intermission, from the east towards the north, and from the north towards the east. During this night, the dreadful image of which will remain indelibly impressed upon my memory, the whole city was involved in the conflagration. Vast bodies of fire, of various colours, arose from all quarters to the clouds, and obscuring totally the horizon, sent forth to a distance a resplendent light and burning heat. The flames, driven in all directions, and propelled by the violence of the winds, were accompanied, in their ascent and rapid progress, by an awful hissing sound and dreadful detonations, resulting from the combustion of powder, salt-petre, oil, rosin, and brandy, with which the great part of the houses and shops were filled. The plates of varnished iron, covering the houses, were speedily detached from them by the heat, and projected to a great distance. Very large pieces of joists or burning beams of fir, thrown afar off, caused the fire to be propagated to those buildings, which were the least exposed, in consequence of their remote situation. Every body was seized with fright and terror. The guard, headquarters, and commander-in-chief of the army, left the Kremlin and the city, and established a camp at Petroski, the castle of Peter the Great, on the road to St. Petersburg. I remained, with a very small number of my comrades, in a house built of stone, and situated in an isolated spot on the summit of the quarter of the city occupied by the Franks, and in the vicinity of the Kremlin. I could observe without difficulty from this location, all the phenomena presented by this dreadful conflagration. We had sent our baggage to the camp, and were constantly on the alert for our preservation, preparing for events or preventing their occurrence.

Those of the lower classes of people, that remained in Moscow, driven from house to house by the flames, gave utterance to mournful lamentations. Being very desirous

of saving from the general ruin, the most valuable of their possessions, they burthened themselves with large pack-ages, which they carried with difficulty, and were frequently obliged to abandon, in order to remove themselves from the flames. The females, influenced by their natural affection, took one or two of their children on their shoulders, and dragged the others by the hand. In order to escape the death, which menaced them on all sides, they hastened, with their garments tucked up, to take refuge in the squares and corners of the streets. But the rapid progress of the flames soon forced them to abandon this asylum, and fly with precipitation from all quarters. It sometimes happened, that they were incapable of extricating themselves from this species of labyrinth, in which several of them met with an unhappy fate. I saw old men, whose long beards were burned by the flames, drawn in small carts by their own children, who were making great exertions to snatch them from this true resemblance of Tartarus.

As respects our soldiers, who suffered much in consequence of hunger and thirst, they exposed themselves to every danger, in order to gain possession of the articles of food, wine, liquors, and other things of greater or less utility, contained in the burnt cellars and shops. They ran through the streets promiscuously with the desperate inhabitants, carrying with them all that they were capable of snatching from the ravages of this awful fire. In short, in eight or ten hours, this extensive and splendid city was reduced to ashes, with the exception of the palaces of the Kremlin, some large houses, and all the churches, which were built of stone.

This calamity gave rise to great consternation in the army, and foreboded greater misfortunes. It was universally supposed that it was no longer possible to obtain either sustenance, or cloth, or other articles necessary for clothing the troops, and of which there was the most urgent need. What idea of more ominous import could have presented itself to our imagination?

Head-quarters, subsequently to the fire, were established anew in the Kremlin, and the guard located itself in some houses, situated in the quarter of the Franks, which had

not been destroyed by the flames. Every body resumed the exercise of his duties.*

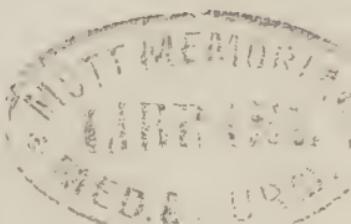
Examinations being instituted, magazines of flour, meat, salted fish, oil, brandy, wine, and liquors were discovered. The soldiers received distributions of a portion of these articles; but there prevailed too great a desire to preserve or store them away, and this excess of foresight, which is sometimes nothing more than a pretext, led to the subsequent destruction by fire or desertion of these various stores in the magazines. They would have proved most beneficial, and would have sufficed for the necessities of the army, during a period of more than six months, had it continued to remain in Moscow. More especial attention should have been paid to the acquisition of cloths and furs, so as to furnish our troops with garments capable of defending them as much as possible against the rigour of the cold, which was to be expected. In relation to themselves, however, the soldiers, who entertained no thought concerning the future, instead of supplying this deficiency of precaution for their own benefit, were occupied solely in collecting wine, liquors, gold and silver, and disregarded every thing else.

This unexpected abundance, for which the soldiers were indebted to their indefatigable labours, affected the discipline of the army, and proved injurious to the health of those who were intemperate in their habits. This cause alone should have accelerated our departure to Poland. Moscow became a new Capua for our troops. The superior commanders attached to the army of the enemy, indulged our chiefs with the hopes of peace, and the signature of the preliminaries was postponed from day to day. In the mean time, large bodies of Cossacks hovered around our encampments, and daily cut off many of our foragers.

* The rooks (*corvus-cornix*) which inhabited the steeples of the churches, being driven also by the fire from their accustomed abodes, returned to the possession of their asylum. In point of numbers, these birds might be compared to the pigeons, seen by us in Egypt. Indeed, when these crows issued from their houses in the evening and morning, the horizon was obscured by them. They fed on grain and insects, and were never discovered on the carcasses of horses, lying in great numbers around the city, as was falsely reported.

General Kutusoff drew together the remnant of his army, and strengthened it with recruits from all quarters. His advanced guard, gradually, and under the guise of peaceful motives, approached our troops in the van. The period fixed upon for the expiration of the negotiation had at length arrived, and at the time when the French ambassador expected a final decision, the corps, commanded by Prince Joachim, was surrounded. Our ambassador found much difficulty in overcoming the obstacles which opposed his return to Moscow. Some of our troops, and several pieces of cannon had already been captured. The different corps of the van guard, however, being in the first instance put to flight, rallied, and broke through the Russian column which surrounded it. They took possession of a favourable position, and rushed in their turn on the numerous cavalry of the enemy, which they repelled with violence, seizing on the cannon and soldiers that were taken during the first attack. The arrival of General Lauriston and the wounded rendered us certain at head-quarters, as to the renewal of hostilities. Orders were immediately issued for the speedy departure of the army, the general beating of drums was heard, and all the troops prepared for the execution of this precipitate movement. They hastily provided themselves with sustenance, and commenced their march on the nineteenth of October.

Previously to our departure, we removed to Mosaisk, under the escort of a strong division of infantry commanded by General Claparède, all the transportable wounded and sick. Those, whom it was not possible to carry along with the army, we located together in the Foundling Hospital, in which I left three divisions of surgeons, in order to secure medical attendance to the patients within it. I placed the wounded Russians under the care of several French surgeons, who had resided a long time in the city, and requested this employment of me, with the view of rendering themselves serviceable to these individuals, and meriting the favour of the Russian government. The majority of the French established in Moscow followed the convoy of the sick, under the special protection of the commander of the division, to whose charge Napoleon had committed them.



It was doubtless the intention of our commander-in-chief to attack the army of the enemy, to move on to Kalouga, and effect a retreat into Poland through Ukraine.

The apprehensions entertained of the failure of provisions, and the recollection of the privations which had already been experienced, induced all of our companions to provide themselves with necessaries. Some loaded waggons, others, their horses, and the soldiers their sacks, with articles of this character. The army was never so much encumbered with baggage, as on its departure from Moscow. The troops of Darius, at the period of their leaving Babylon, doubtless did not present such splendour, nor did they possess so large a quantity of baggage. A humid mist, which appeared on the following day, rendered the progress of these equipages extremely difficult, and disorder for the first time ensued, in consequence of each one being desirous of saving his provisions. We rejoined the advanced guard, on the evening of the twenty-third. At this moment the enemy abandoned their position, and marched towards Kalouga.

Prince Eugene, who commanded the troops of the van, received orders to repair, by a cross road, to Malajaroslaw, a small city situated in a defile among the mountains, through which the army of Kutusoff would pass. The treachery of the guides and the bad state of the roads, retarded their march, and the enemy arrived at the defile two hours previous to the corps of the Prince. Our general, however, crossed the rivers, ascended the mountain, boldly attacked the troops of his adversary, and, after a bloody fight, possessed himself of the defile; but it was too late, the greatest part of the Russian troops having already passed through it. This combat reflected the greatest honour on this warrior. The Russians lost upwards of six thousand men. A large number of prisoners, with many pieces of cannon and artillery waggons, were likewise captured by us in this battle. Several of our distinguished soldiers, among whom was General Delzon of the advanced guard, one of my companions in Egypt, and an officer of great merit and rare intrepidity, were killed in this fight. We had also nearly two thousand wounded, who were dressed on the field of battle, and transported in the rear of the army in

private carriages, brought from Moscow. I owe especial praise to MM. Assalini, first surgeon to the Prince, Pinçon, chief-surgeon of the corps, and to all the surgeons of these troops and the *ambulances* of the guard, for the active and vigilant care, bestowed by them upon our wounded.

Head-quarters and the guard reached Malajaroslaw at the termination of the combat, in time to be witnesses of the victory of Prince Eugene. The cannon and waggons, that had been captured, were respectively spiked and burnt, and after a reconnoitring of the troops of the enemy, they were pursued beyond the defile, some leagues on the road to Kalouga. The wounded Russians were conveyed by my direction to Malajaroslaw. It was not possible for me to remain, in order to see the requisite attention paid to them; but I departed with the hope that they would receive assistance from their countrymen.

The *état-major* and the guard, returned on the same evening to the position occupied by them on the preceding day, in a large village, two leagues from the field of battle. I followed this movement, and, on my arrival, arranged an *ambulance* for the reception of the wounded.

On the morning of the succeeding day, which was the twenty-fifth, at dawn, Napoleon, returning from Malajaroslaw, where he had spent the night, was suddenly surrounded, together with his guard, by several thousand Cossacks, whom it was at first impossible to distinguish, in consequence of a thick fog. They took some pieces of cannon, and wounded many of our light horse. Napoleon himself was exposed to great danger. The troopers of the guard, however, having recognized the enemy, performed prodigies of valour, and, dispersing them, notwithstanding very great difficulties, regained possession of the pieces of artillery. The only resource for the opposite party was a prompt retreat, which they commenced on the following day. The course we should pursue was not yet known to us. We moved on to Borosck, or the city of filberts, so surnamed, in consequence of the great quantity of this fruit found by us in the houses in our first passage through it.

After passing this place, we traversed a portion of country, which was agreeable, rich, and very thickly inhabited.

It was desirable, that we should be enabled to continue our route in this direction, and enter Ukraine, in order to effect our retreat through this province. But Napoleon wishing, doubtless, to save the great number of our wounded and sick, in the *ambulances* at Mosaisk, Kolloeskoi, Giad, Wiasma, etc. and being aware of the arrival of Tormasow, who had intercepted the communications with Borrisow, concluded upon resuming the road pursued by us on entering the country. We reached it in a very few days. This was a subject of much melancholy throughout the army, which had glimpses of the misery we were doomed to endure, in passing through an immense tract of country, already become desert and waste, in consequence of the destruction of its villages and cities, and the constant passing and repassing of our troops and the Cossacks. We entered Mosaisk, in which there were many sick, both Russian and French. Those who were capable of marching, or of being transported, were removed. The rest were located in an hospital, and I left them and the wounded Russians also, under the charge of surgeons, having procured for them all other possible succour. A large portion of the equipage of the army had already disappeared, and there had been but a partial distribution of the biscuit and flour, which were found in the storehouses.

We continued our march, however, and arrived at Kolloeskoi. The weather was remarkably fine from the period at which the battle of the twenty-fourth was fought, until our arrival at Mosaisk. But on our departure from this city, the north-east winds commenced blowing, the cold progressively increased, and became very severe, so that in our passage across the field, the scene of the battle of the Moskowa, we found the bodies of those who had been killed in this combat in a state of congelation.

In the villages contiguous to the road, and at the abbey of Kolloeskoi, we met with the *ambulances* which had been there established. In one of those were the Russian officers, of whom I have already spoken. They were cured of their wounds, and some of them came to express their gratitude. They requested permission to remain in their native country, which I obtained for them without difficulty. Money was also given them by me, for the purpose

of procuring from the travelling Jews articles of primary necessity, until the arrival of their countrymen. I recommended, at the same time, our patients to their care, and have grounds for believing, that these officers protected them, and were not forgetful of the services they had received from us.

I adopted the same measures respecting the wounded at Kolloskoi, that had been pursued at Mosaisk. A part of the night was spent in performing operations on certain of these patients, who were exposed to death from comminuted fractures and extensive ulcerations of the extremities. Placed in the carriages of the army, they followed the baggage of head-quarters. The surgeons of our *ambulances*, who accompanied them, performed the duty of daily dressing their wounds. The scarcity of means had already become great. The snow fell in large quantities, and the cold was constantly augmenting in intensity.

Here commenced the disorganization of the army, which rallied but imperfectly at Wiasma. The road had already become difficult of being passed in consequence of the snow, with which the ground was covered, and the soldiers endured much suffering in the bivouacs. At Wiasma, the army received some distributions of flour, and a very small quantity of bread.

Head-quarters and the guard remained in this place twenty-four hours, for the purpose of recruiting the troops, and dividing among them the few provisions that remained in the storehouses of this town.

Having dressed the wounded, both Russians and French, in the hospitals, we removed towards France those of our men in a condition to proceed on the journey, and located together those patients that could not be transported. We placed these in a building both strong and affording protection against the flames, which were constantly renewed in the wooden houses, either through the imprudence of our soldiers, or in consequence of the contiguity of the bivouac fires to these buildings. This is one of the calamities attendant on war, and of very common occurrence, particularly in winter campaigns.

Means of transportation being wanting, the emperor Napoleon placed at our disposal his covered waggons and car-

riages for the benefit of the wounded. His household surgeons and physicians, were charged with the duty of following and attending to them. I should commend the zeal and devotion, exhibited on this occasion, by MM. Ribes, Jouan, Lherminier, and Mestavier. M. Rouyeres, the pharmaceutist, was no less serviceable to our sick.

PART THE THIRD.

THE rear-guard, commanded at that time by Prince Eugene, immediately followed us in our passage out of Wiasma, a city almost totally reduced to ashes, and filled with the ruins of burnt houses. This rendered the march very difficult, particularly for the equipage and artillery. Several divisions of the Russian army arriving in consequence of it near this city, previously to the departure of our rear-guard, took advantage of this circumstance to attack these troops. The assault was attended by results, which were rendered more fatal, by the thick and hazy mist, through which it was made. Such was the obscurity, in which every thing was involved, that the troops of the fourth corps were soon confounded with those of the Russians, and it proved to be a very unfortunate catastrophe.

This event was one of the primary causes, which gave rise to the loss of our wounded, (at least of those attached to the fourth corps,) and a part of the French families that had been established at Moscow, and by which these soldiers were accompanied.

The corps of Marshal Ney was substituted for that of Prince Eugene, whose troops sustained considerable loss in this unfortunate affair.

The army, however, moved on in sufficiently good order, but the effects of privation and cold were felt more and more sensibly. Already had the wounded, and the most debilitated individuals, succumbed to these cruel vicissitudes. The horses, particularly, deprived of forage, and constantly on the bivouac, perished in great numbers. It frequently happened, that the soldiers killed them previously to their falling down. The flesh of these animals, which was roasted at the first fire of the night watch, allayed the hunger with which our men were tortured.

We passed the Dnieper, a short distance from Dorogobouje. As three-fourths of this city had been destroyed by fire, it offered very few resources. We found in this place many wounded, for whom it was difficult to obtain flour, and even a small quantity of bread. Those that were able to proceed on the journey followed the army, and the non-transportable patients were located together in the strongest and best of the hospitals. Some of the latter, alas! perished in the flames, which broke out, during the night, in a house contiguous to the *ambulance*. The fire, progressing with very great rapidity, destroyed, in a few moments, all the buildings in the same quarter. I escaped from this hospital through the midst of the flames, and not until I had had recourse to all the means which I, in conjunction with my assistants, could suggest for the preservation of the wounded, and which the rapid propagation of the fire suffered us to employ.

After a very laborious march of several days, through a country uninhabited and covered with snow, we arrived at Smolensk, November the twelfth.

During this interval, our soldiers continued to feed on the flesh of the dead horses, which were found in great numbers on the road.

We all entertained hopes, that our sufferings would terminate on reaching the confines of ancient Poland. There were grounds for believing that large storehouses had been established at Smolensk, and that we should be enabled to repose here for some days. But our expectations were not realized. There was scarcely any sustenance, in this place, for the wounded and sick, who crowded the hospitals. The army received very limited distributions, and was necessitated to continue its march in this state of deprivation.

Here, indeed, commenced the horrible sufferings, to which we were doomed to be subject during this fatal retreat. The soldiers, enduring much misery from hunger and the want of all the necessaries of life, after having broken through the gates of the city, and penetrated into the magazines, from which they took the small quantity of inferior biscuit remaining in them, were destined to undergo the most grievous privations. The situation of the surgeons was particularly lamentable. Being obliged to

spend the whole of their time in dressing the many wounded, situated in the hospitals, they were incapable of making exertions for the purpose of procuring sustenance for themselves. No resources whatever could be found by them in these establishments, since the patients were in need of such things. I was, however, so fortunate as to purchase, for a large sum, two bags of flour, which I distributed among those of my comrades, whose necessities were most urgent.

I visited all the hospitals of this city, and after having bestowed upon them my services, and caused those operations, which were more immediately necessary, to be performed on the great number of wounded there located, left them under the care of fifty surgeons, who requested to remain.

Arrangements for resuming our march had scarcely been made, when our rear-guard was attacked by the Russian advanced troops, by which it was pursued until its entrance into Smolensk on the thirteenth of November. A vigorous resistance, however, was made by our troops, and the army had time to evacuate the city and betake itself to the mountains in its vicinity. This new occurrence, by hastening the progress of a part of the equipages and treasures, which pursued a cross road, produced such confusion that they soon became a prey to the Cossacks.

The cold had become very intense. Already had the thermometer of Réaumur fallen to 19° below zero, and the north-east winds were blowing with violence. This severe cold, supervening so suddenly, proved destructive to many of our younger soldiers, and particularly to animals, which were frequently found, on the edges of the road, lying dead upon the snow. Those of our companions that were accustomed to marching, and had preserved some coffee and sugar, were less exposed to the dangers of their situation. Habitual exercise prevented numbness of the limbs, and supported the calorification and play of the organs, whereas the cold, seizing on the individuals carried on horses or in carriages, soon threw them into a state of torpor and paralytic stiffness. They were thus induced to approach the fires of the bivouacs more nearly, in consequence of their not being sensible of the heat in the frozen parts. Gangrene was brought on; and I had the good fortune to preserve myself from this

affection, by walking constantly, and totally depriving myself of the enjoyment of fire.

No habitation was found between Smolensk and Krasnoe, distant from each other about twenty-four leagues. Every thing had been burned, the ground was covered with snow, and the cold had increased two degrees in intensity. The army took some hours of repose during the night in the forests through which it was passing. But the troops generally endured many hardships, arising from hunger, and the great reduction of temperature. In this short march much search was made for the bodies of horses.

The horse that had gone astray was immediately knocked down and devoured, when scarcely dead. Unfortunate was the fate of that animal, which departed a few steps from his master! The division of this booty sometimes became a subject of dispute between individuals of all ranks. Even the females surmounted all obstacles, in order to obtain their portion of the spoil.

The army, which was disunited in its passage out of Smolensk, again lost many men between this city and Krasnoe. Cold and hunger were the chief causes of their death. The equipages and parks of artillery were cut off and dispersed by the Cossacks, with a greater degree of facility, in consequence of the roads being covered with ice, by which the march was rendered extremely difficult.

We had entertained hopes of finding provisions in Krasnoe, and of remaining there at least twenty-four hours. But we were again doomed to disappointment. At the dawn of the following day, the seventeenth of November, we discovered ourselves to be almost surrounded by a very numerous Russian army. It was necessary to engage in battle, as much for the purpose of rendering ourselves capable of continuing our retreat, as to prove to the enemy, that we were not so destitute of means of defence, as they supposed. The rear and elder guards were alone in a condition to sustain the shock. The troops of this latter corps, particularly, fought with extreme valour. Nearly two hundred of our men were wounded, whom I caused to be conveyed to the hospital in Krasnoe. I repaired thither, with the view of operating on those who were most seriously wounded, and dressing the remainder of them. Although a pretty large number of inhabitants continued in this city, the

majority of them were Jews. We were in want of nearly all the necessary means for dressing the wounds of these interesting sufferers, and I experienced the greatest difficulty in securing to them the requisite assistance. They were thus destined to endure much misery, subsequently to our departure. In consequence of our destitution of modes for transporting the sick, we were able to take with us, but a very small number of these patients. Those, who were incapable of following the army, were placed together in the hospital of the city, in which I left surgeons, for the purpose of pursuing their treatment.*

It was a matter of urgent necessity that the army should resume its march after the battle, in order to avoid a new attack, and reach, as speedily as possible, those parts that were inhabited and provided with store-houses. All the troops, with some exceptions, were without arms, and in complete disorder. The guard, though reduced to less than half of its original number, was the only corps that had preserved their arms and good discipline. It was this body that protected the march of the isolated troops, and kept in awe those of the enemy, which incessantly pursued and harassed us.

On our departure from Krasnoe, the temperature rose from ten to twelve degrees, and our sufferings from the cold were much diminished. But we were greatly fatigued by the snow, which fell in great quantities for several days, and were much tortured with hunger, as hunting for provisions had become more difficult, on account of the many partisan attacks on the flank of our army. No halt was made at all, except for some hours during the night, in those places where resources could be found, or in the forests, with the view of kindling the fires of the bivouacs.

* In this painful and extremely perilous situation, every body in the army exhibited an imperturbable *sang froid*. The French females even, who were capable of following the army, partaking of our privations and dangers, carried their courage to such a pitch, as to aid us in dressing the wounded under the cannon of the enemy. Madame Aurore Bur-say, directrix of the theatres at Moscow, and moreover celebrated for her dramatic talents, particularly distinguished herself for her humanity, and a degree of firmness little known in her sex.

We moved on hastily to Dumbrona, a small city inhabited by Jews, in which, however, we were enabled to purchase a small quantity of indifferent brandy and bread. Our sick in the *ambulance* established in this place were numerous. Several surgeons were left here also, in order to secure medical aid to the wounded, incapable of following the army. A violent conflagration developed itself, at the moment of our departure, in one of the quarters of this city; but I have since been informed, that the flames were not propagated to the hospital.

On arriving at Orcha, we passed the Dnieper for the last time. The bridge very fortunately had not been cut down, and the river was not entirely frozen. The whole army under the constant protection of the guard, crossed it without difficulty. The rear-guard, commanded by Marshal Ney, it is true, kept back the Russian troops, which pursued us. At the period, when he hoped to effect a junction with us, the marshal was surrounded, and summoned to surrender. Our communications with this corps were intercepted, and we spent twenty-four hours at Orcha without receiving any tidings respecting them; our uneasiness on their behalf was at its height. In this place we found some resources, which served particularly for our sick. Nearly all of those patients who followed the army, were located in the hospitals of this town. I spent the whole night, of our arrival and the following day, in having the wounded dressed, and in seeing the necessary attention paid to them. I also left with them the requisite number of surgeons.

The troops continued their march towards Tolecsehyn; but a guard was placed at the bridge, as we did not despair of the arrival of the rear-guard. Indeed, an officer, despatched by Marshal Ney, brought us the information, that his intrepid soldiers, entertaining no thought of surrendering, notwithstanding the numerous troops of the enemy, by whom they were surrounded, had broken through the Russian columns, opened a passage for themselves, and arrived on the banks of the Dnieper. It was with extreme pleasure, that we again saw them in our presence.

These troops having crossed the bridge, it was broken down and burnt in the face of the enemy. Their

march was thus arrested for some days, in consequence of the river being not yet completely frozen. Notwithstanding this advantage, our retreat became progressively more difficult. The horses, attached to the artillery, were in bad order, the roads almost impassable, and the snow had not ceased to fall, since our departure from Krasnoe.

We then reached Tolecsehyn, a city distinguished for the bloody battle fought under its walls between Charles XII. and the Russians. A considerable storehouse for flour, together with a pretty large quantity of brandy, was found in this place. Our stay here of twenty-four hours was of the greatest benefit both to the troops and horses. We left few patients in this town.

On departing from Tolecsehyn information was brought to us, that the second corps, commanded by Marshal Victor, had effected a junction with our advanced guard; but we were at the same time apprized of the arrival of Tormasoff's army at Borrisow. Marshal Victor suspended his march, and suffered us to move on, for the purpose of forming the rear-guard, his troops superseding those of Marshal Ney, which had endured many hardships.

The winds, having continued to blow a pretty long time from the north-west, passed gradually around to the north-east. The temperature suddenly became still lower and the cold intense, being proportionally aggravated by the violence of the winds. We then arrived before Borrisow, the bridge at which place had been destroyed by Tormasoff, who occupied the city and its environs on the right bank of the Berezina, a position both impregnable and out of the reach of our cannon.

Our path of retreat being cut off and being inaccessible, it was resolved to cross the river some leagues higher up, while preparations for an attack should be apparently made opposite the enemy. The point, at which the passage was to be effected, was before a very large village, where nearly all the materials, necessary for the construction of the bridges, could be obtained. It appears, that Charles XII. crossed the Berezina at the same spot before the battle of Tolecsehyn, when he went in pursuit of the Russians, and avoided entering Borrisow, defended doubtless by numerous troops.

While the bridges were being constructed, head-quarters

and the guard established themselves, on the night between the twenty-fourth and twenty-fifth of November, in the castle of a prince of Radziwil, distant about a league from the place which was pitched upon for passing the river. This castle, with its dependancies, occupied the eastern side of a hill, which was situated on the right bank of the river. The farms belonging to it abounded in forage and cattle, which proved very serviceable to the cavalry, that remained with us, and to the whole guard. Flour and a large quantity of dried pulse were also found on them.

In consequence of my entertaining fears of being burned in the barns, I remained in the bivouac among the grenadiers. The sky was serene and the cold intense. Being obliged to pass through the camp, during the night, for the purpose of visiting the wounded that followed the army, I could observe, without difficulty, all that surrounded us. I was quickly struck by the appearance of a comet, which was nearly parallel with the horizon, and could be seen by the army, situated directly in the north. This luminous body appeared to descend towards the north pole, and, becoming elongated in a perpendicular direction, terminated in a point, from which was sent forth a small beam, rising in a vertical line to a very great distance. It disappeared on the same night, and did not again present itself. This singular phenomenon was observed in several parts of Europe, and particularly at Leipsic.

The two bridges, the construction of which had been undertaken, were, in the mean time, completed without the knowledge of the enemy. The guard succeeded the first and fourth corps in their passage across them, and reached the opposite bank, without opposition and without accident. But as the cannons of large calibre were passing to the opposite side of the river, one of these bridges was broken down. The progress of the remainder of the artillery, of all the equipage, and *ambulances*, was thus arrested. This occurrence gave rise to great alarm among those that remained on the left bank. At this moment of suspended operations, the troops of Wittgenstein, which followed us closely, attacked our rear guard. All possible resistance was made by the latter. Being forced from its

position, this body endeavoured to effect their retreat, and facilitated by this movement the approach of the enemy, whose bullets and other projectiles fell among the immense crowd already collected at the head of the bridges. The latter had doubtless been repaired, but had become impassable from the impediments and disorder, of which they were the scene. Fear pervaded the minds of all. The multitude crowded, dashed on all sides, and rushed one against the other. The strong overpowered the weak, and the latter were trodden under the feet of the crowd. The carriages, artillery and baggage waggons were overturned and broken to pieces, and the horses and drivers crushed under the wreck. In short, nothing was heard on all sides, but lamentable shrieks. To complete this tragic affair, the badly secured bridges were again broken. From this moment, all hope of safety was apparently destroyed. The majority of the multitude were influenced only by despair. They rushed on a body of ice, supposing it possible to cross the river in this way, as the stream appeared to be congealed. But their progress was arrested, near the opposite bank, at a point, where the body of ice was interrupted by the force of the current. Some swam across this space; others had the misfortune to be drowned, or to become entangled amidst the sheets of the frozen element. They perished in this situation the more speedily in consequence of their being already benumbed by the cold, and attenuated by privations. Those possessed of more courage and prudence returned, in order to throw themselves into the power of the Russians, and withdraw from the horrid spectacle they were witnessing.

Many individuals, of all classes, lost their lives in crossing the Berezina. Mothers were seen voluntarily following the fate of their children, who had fallen into the river, or drowning themselves with their offspring, holding them tightly in their arms. Many other acts, of a character equally touching, were observed during this calamitous state of things.

Notwithstanding the difficulties, which were almost insurmountable, I had repassed one of the bridges some hours previously to its rupture, for the purpose of having

some cases of surgical instruments, which were much needed by the wounded, conveyed to the right bank of the river. This short journey was near costing me my life. I had like to have perished in the crowd in my turn, when fortunately I was recognized. Every one immediately made exertions to aid my efforts, and carried from soldier to soldier, I found myself, to my great surprise, in a few moments on the bridge. This evidence of their attachment to me soon obliterated from my memory both the dangers, to which I had been exposed, and the loss of my baggage.

The corps, that passed the river in the first instance, surprised the enemy behind the city of Borrisow. The troops of the latter defended the passage with obstinacy, and appeared inclined to abandon the city, in order that they might retain possession of the road. Our position was thus rendered very difficult, on account of the losses we had sustained. In the first battle, however, which occurred, three thousand Russians were made prisoners and many of them killed. About six hundred of our men were wounded, whom I located in a neighbouring village, where I caused them to be dressed.

A retrograde movement, made by Tormasoff, as much for the purpose of facilitating his retreat as for arresting our march, gave rise to a second combat, in which was chiefly engaged the corps of Prince Poniatowski. Among the soldiers who were seriously wounded in this battle, I received, in the *ambulance* on the field of battle, General Zayonzeck, one of the oldest Polish generals in the service of France. He had made the campaign in Italy, Egypt, and all the northern countries of Europe. This brave general laboured under a comminuted fracture of the right knee, caused by a ball, which inflicted the injury almost immediately after being discharged from the gun containing the projectile. He received the wound at the head of his division. Amputation of the thigh was imperiously demanded, and I performed it immediately under the cannon of the enemy, on the snow, and during the most severe cold. This operation, remarkable for the singular phenomena which presented themselves, was followed by unexampled success, and Poland boasted of still possessing

one of her most illustrious warriors, aged upwards of eighty years.

With the exception of some individuals, mortally wounded, whom I left with succour in the village of which I have just spoken, all those who had been wounded in these two combats, were immediately removed to Wilna on sleds, obtained from the inhabitants of the country.

A transverse road was discovered, by pursuing which we would be enabled to reach this city before Tormasoff, and without being disturbed by his troops. This route was first entered upon by the wounded, and, as respects the equipage, it was entirely out of the question, in consequence of its still remaining at the point where the Berezina was crossed. Having vanquished and repelled the army of the Russian general, who thought to allure us on the road he was pursuing, we promptly commenced our march through the defile, which had been discovered to us. It passed through immense forests and marshy places, interrupted frequently by streams or rivers, the bridges across which were in a very bad condition. A company of Cossacks, provided with but one piece of artillery, could have arrested our progress on this route with facility. We fortunately marched through it without any remarkable obstacle or accident, and reached the grand road to Smorgonia,* two days in advance of Tormasoff. From this city Napoleon departed in order to return to France, having intrusted the command of the army to Prince Joachim Murat.

Though the cold had been constantly augmenting, since our passage across the Berezina, the mercury had not yet fallen below from ten to twelve degrees. On the day of our arrival at Smorgonia, snow fell crystallized in the form of stars. This phenomenon was the precursor of excessive cold, which appeared immediately afterwards. During the night, which we spent in bivouacing, the mercury descended to eighteen degrees. It then passed

* Smorgonia is distinguished by a kind of academy, for the exercise of young bears.

quickly to the nineteenth, twentieth and twenty-first of Reaumur.

On the following day, December the sixth we commenced our march at a very early hour, for the purpose of arriving very speedily at Osmiana, another pretty large city, in which we found some Jews. Indifferent brandy and bread were purchased of the latter. The cold progressively increased. The rivers were entirely frozen, before we reached Smorgia. On entering Osmiana, my thermometer indicated twenty-five degrees it fell during the night to twenty-six degrees of Reaumur, and the bivouac was one of much suffering. I was so fortunate, as to pass this fatal night in a warm chamber on a little straw, after having taken some aliment, which was kindly presented to me by M. Pla, one of my old companions in Egypt. We pursued our march before dawn on the following morning, the mercury standing at twenty-seven degrees. It was with difficulty, that any one could then keep himself erect and execute simple movements. He who lost his equilibrium and fell to the ground, was immediately seized with a mortal stupor and icy coldness. We found on the road a great number of dead, of the twelfth division, which we met at Osmiana.* I left in this city, together with some surgeons, all the wounded, who were desirous of remaining. It was a matter of great pain to me to see them perish on the road, without being capable of affording them any assistance. With the exception of some choice troops of the guard, which had preserved their cloaks or over coats, their shoes and stockings and gloves, the whole army was in a state of sad deprivation, unprovided with arms, and any mark capable of distinguishing the corps. Marching in complete confusion, they resembled large masses of men moving on in one body. The cold, and their debilitated condition, led each one to support himself on the other, and stand in close contact. But nothing was more odd and more lamentable at the time, than the manner in which they were

* This division, commanded by General Loison, consisted of twelve thousand men on leaving Wilna, but three hundred and sixty of whom returned to France, according to the report of several officers.

clad. Their garments consisted of portions of furred robes, cloaks, or cloths of various colours. The fire of the bivouacs had gradually, and in a great measure, consumed these articles of dress, and the soldiers possessed no means for mending them. Indeed, they thought not on this score, and little opportunity was afforded them to do so, as no halt was made at any place. All these circumstances explain the state of destitution to which this grand army was reduced, before its arrival in ancient Prussia.

Our journey to Miedneski, a place remarkable for a castle (*Rownopoli*), blackened and dilapidated by age, was distinguished for the extreme intensity of the cold. The majority of the houses in the village, situated at the foot of this castle, having been burnt or demolished, the whole army was necessitated to bivouac. Woe to the man, who suffered himself to be overtaken by sleep! A few minutes sufficed for his entire congelation, and he perished on the spot where he slept.

My thermometer, suspended some moments during the night to my buttonhole, indicated twenty-eight degrees. The temperature of the day differed in a very slight degree from that of the night; the rays of the sun being unable to penetrate the air, which was much condensed. We were surrounded by a mist, very much rarefied, and forming crystals, both on the hairs of the body, and villous parts of our clothing. Those which were suspended from the eye-lashes, in the form of stalactites, intercepted the light, in a more or less complete manner. This circumstance greatly impeded the march, which was attended with extreme difficulty, to Wilna, Kowno, and to a greater distance, in consequence of the cold continuing nearly at the same degree of intensity.

The edges of the road were strewed with soldiers, who had perished in their march, during the night between the eighth and ninth of December. They had chiefly belonged to the twelfth division, which consisted almost totally of young men. We were, in short, in such a state of faintness and torpor, that we were scarcely able to recognize each other. Our march was conducted in sullen silence. The organ of vision and muscular power were respectively so much debilitated and reduced, that it was difficult for an

individual to pursue his way, and preserve his equilibrium. The soldier, that was overpowered, fell at the feet of his companions, who did not turn aside to behold him. Though one of the stoutest individuals of the army, it was scarcely possible for me to reach Wilna. On my arrival in this city, my strength and courage were exhausted. I was near falling, doubtless to rise no more, as was the case with other unfortunate persons, who died before my eyes.

The very tender reception I received from the grey sisters of La Charité, on entering their hospital the evening of the ninth, and the vigilant attentions, prodigally tendered me by them, restored me to life. This circumstance will continue for ever engraven on my memory.

The eagerness with which every one endeavoured to enter Wilna, the arrival at which had been anticipated with so much pleasure, but in which, we met only with sufferings and misery, produced in a few moments a dreadful confusion at the gates. The soldiers knocked down and tore each other away, in order to gain entrance into the city. Although the convents had been assigned, and arranged for each body of troops, all the corps disseminated themselves through the city, and immediately filled the coffee-houses, inns, and grocers' shops. They drank and eat with such avidity, that in a short time all the liquids and eatables were consumed.

Notwithstanding the extreme disorder, prevalent in all quarters, the night passed off without accident. Those that were not able to obtain lodgings in the convents or houses, bivouaced in the squares and streets of the town, and found this more pleasant than their preceding bivouacs.

The Cossacks, in the mean time, menaced the suburbs of Wilna. Their approach caused the rear of the column to retreat precipitately, on the morning of the tenth, within the boundaries of the city, and the disturbance and confusion were thus augmented. The sentinels, guarding the magazines, were driven from their posts, the doors forced, and the articles of food and clothing pillaged by our troops and the Jews. The disorder was carried to an extreme, and the voice of authority totally disregarded.

Through the midst of the tumult, Prince Murat, who had command of the army, issued hastily from his palace,

passed through the crowd without his guard, and proceeded to establish himself in the suburb on the road to Kowno, where the *état major* and guard rejoined him a few moments subsequently. The pillage of the magazines had placed a large quantity of rum and brandy at the discretion of the soldiers, the majority of whom made an immoderate use of these articles. The number of sick was thus multiplied ; gangrene was developed in the extremities, and caused the death of many of them.

In relation to myself, after having taken some hours of repose, I quickly visited the hospitals, in order to render secure the duties to be performed in them, so far as they had reference to my province. I located in the hospital of La Charité the sick surgeons and principal wounded officers, whom I confided to the particular care of the good sisters. Independently of the invalid surgeons, a sufficient number of these health officers, of all ranks, was left in each hospital, for the treatment of the wounded remaining in this city. I gave them letters of recommendation to the chief physicians of the Russian army, and made my arrangements to effect a junction with the guard and head-quarters. I commenced my journey during the night, between the tenth and eleventh, and, instead of stopping in the suburb, in which they were situated, proceeded on my route towards Kowno.

On the morning of the following day, the eleventh, the Cossacks entered Wilna, and threw terror into the ranks of all the French, who remained there in considerable numbers. The Jews treated them unkindly, and epidemic maladies successively attacked a great part of those who had escaped the foregoing catastrophe, and the destructive effects of cold and hunger. I shall have occasion to speak of these afflictions in particular memoirs.*

On our departure from Wilna, the temperature rose some degrees. There fell, in this short time, a very large quantity of snow, which rendered almost impassable the passage across the mountain, lying in our route, some

* We subsequently learned, that the arrival of the Emperor Alexander re-established order in this city, and that our prisoners derived much benefit from his munificence and humanity.

leagues from the city. The few equipages and waggons laden with treasures, which had been preserved from the preceding dangers, were abandoned or burnt on this fatal mountain ; it may thus be said, that Wilna was the scene of almost as much misfortune to us, as the Berezina.

During the night between the twelfth and thirteenth, the temperature was again reduced, and the cold resumed its former intensity. It continued at the same degree, until we had proceeded beyond Kowno. Our entrance into, and passage through, this city, were attended with as much difficulty and labour as at Wilna. Many of our junior soldiers perished in this place, in consequence of intoxication, brought on by alcoholic liquors.

I had the good fortune to find, in this city, my friend Doctor Ribes, whom I had not seen since our departure from Wilna. He was in the lowest stage of exhaustion, caused by fatigue and the effects of the rigorous cold, which overcame the most robust constitutions. I have remarked, *caeteris paribus*, that those temperaments, entitled warm and sanguine, resist much better the action of this sedative agent, than those designated by the generic term of lymphatic. Thus, the ravages of death were more rarely displayed among those individuals, who were from the southern countries of Europe, than among the inhabitants of the northern and moist locations, such as the Hollanders, Hanoverians, Prussians, and some of the people of Germany. The Russians even, agreeably to the report made to me by several surgeons who remained at Wilna, lost, from this sole cause, more men, in proportion, than the French. I employed all the means, which friendship demanded of me, for restoring to M. Ribes the strength of which he had been deprived, and for aiding him to reach the frontiers of ancient Prussia, a country which we but lately considered as a second home.

On the day succeeding our arrival at Kowno, I was busily occupied in visiting the hospitals, which were filled with sick. Those, that were able to accompany us in our march, were removed to Prussia. Provision was made for the subsistence of the rest, and the requisite number of surgeons was left with them to render secure their medical treatment. Here, as at Wilna, the magazines were pil-

laged, a circumstance that prolonged the disorder and excesses of our army. Our partizan enemies, moreover, did not delay their attacks upon us. The greater part of our troops resumed their march on the morning of the thirteenth of December. I did not take my departure from this place until the fourteenth, at break of day, accompanied by my friend, and some soldiers of the guard. We had much difficulty in passing the bridge, which was in a state of great confusion, and also reached with much labour the summit of the mountain, situated before Kowno. Nearly all the pieces of artillery removed from the city, were abandoned on this path, which was both steep and covered with ice. This route proved fatal to many of our soldiers, who were debilitated by fatigue, cold, and famine. They could not escape the pursuit of the Cossacks, who had passed the Niemen with dry feet. This river was frozen several feet in depth, and this circumstance proved as advantageous to them, as it was unlucky for us, in consequence of our being almost totally destitute of a rear-guard to protect the march of our isolated soldiers. Some of the guard, who were still in possession of their arms, finding themselves exposed to the charge of these Cossacks, made vain efforts to rally in order to repel them. The cold steel of their weapons paralyzed their fingers, and their guns fell from their hands, they being incapable of loading and using them. These soldiers were forced to rejoin us precipitately.

The enemy finally arrested their march, and ceased harassing us, either because they preferred capturing the remainder of our equipages and pieces of artillery, which they found accumulated in the road, or on the back of the mountain, or because they were fearful of removing themselves too speedily from their frontiers. We marched for some days peaceably and in safety. The soldiers of different nations, profiting by this period of repose, dispersed and repaired by diverse routes to their points of destination. The French alone pursued the road to Gumbinen.

Three thousand men, consisting of the best soldiers of the guard, as well infantry as cavalry, nearly all of whom were from the southern parts of France, were those only, who had truly resisted the cruel reverses of the retreat.

They still preserved their arms, their horses, and their warlike appearance. The marshals, dukes of Dantzick and Istria, were at their head. Princes Joachim and Eugene marched in the centre of this corps, which may be considered as the remnant of an army, composed of more than four hundred thousand men, whom the inhabitants of the country saw, six months previous, marching in all their strength and glory. The honour and renown of the French armies were, in a measure, concentrated in this small chosen body.

The first two days after our departure from Kowno were spent in much suffering. We constantly endured many hardships through hunger and the severe cold. But having reached Gumbinen, and subsequently to our arrival in this place, we found lodging-places, and a sufficiency of sustenance for the nourishment of the troops. Never did I spend a night more agreeably, than that passed by me in this city. This was the first occasion, since I had left Moscow, on which I enjoyed a complete repast, and lay in a warm chamber and good bed. This also was the first opportunity, which we had of continuing in the midst of these advantages. The interval permitted the isolated troops to continue their way to Konigsberg, and enabled many soldiers, who had been separated from the guard, to rally under its colours. Some detachments of Neapolitan guards were likewise received, with several pieces of cannon, and some cavalry. These different reinforcements so augmented our *corps d'elite* as, to render it capable of facing the enemy, and even forming our rear-guard. From this period, we continued our march with order and better discipline. Quarters and regular distributions were procured in those places where storehouses were established. New garments, furnished by the French magazines in the first cities of ancient Prussia, were given to the soldiers, and they entered Konigsberg from the twenty-fifth to the twenty-sixth of December, in good order and pretty good plight.

In the hospitals, lying on our route, I merely left, with the necessary number of surgeons, those patients that were incapable of accompanying our troops. At Insterburg I was detached from head-quarters, and the guard, in or-

der that I might arrive speedily at Konigsberg, where my presence was urgently demanded for the organization of the hospitals. I reached this place, attenuated by fatigue and overcome by the intense cold, which still* prevailed, during the night between the twenty-first and twenty-second of December, leading by the bridle the only horse which remained in my possession. His preservation I owed merely to the useful precaution I had adopted, of having him shod appropriately in consequence of the ice, previously to my departure from Insterburg.

* On our entrance into Konigsberg, the thermometer of Reaumur stood at twenty degrees. On the following day it stood at eighteen degrees, and had not risen above fifteen degrees on our departure from this city, the second of January.

PART THE FOURTH.

ON the day following my arrival at Konigsberg, December the twenty-second, notwithstanding my debilitated condition, I visited all the hospitals of the place, accompanied by M. Gilbert, physician-in-chief. I gave instructions, hereafter laid down to the surgeons, for the dressing of gangrenous affections, resulting from congelation, and distributed among the hospitals all the health-officers, whom I had brought from the army. I finally gave an account to the inspector-general of the result of our examination, demanding of him the execution of measures for the improvement of these establishments.

The number of sick and wounded, already collected in this city, which became the general rendezvous for the grand army, amounted nearly to ten thousand. The hospitals were greatly crowded with them, and some even were located in the houses of the town. Each corps, however, having received a particular destination on the borders of the Vistula, repaired successively to their respective situations. By means of sleds and over the frozen *Frisch-Haff*, all the sick, that were capable of supporting the journey, were removed towards Elbing and Dantzick. The imperial guard alone, with the *etat-major*, remained at Konigsberg.

Having organized my staff, I gave M. Bancel, chief-surgeon, instructions to exercise a supervision over all of its departments, and to treat the surgical diseases with all possible care. I subjoin the extract of my letter to this surgeon:

“ I beg you, Sir, to transmit to the surgeons on duty the following observations, which you will subject to the modi-

fications, that may be suggested by your experience, and by attending circumstances.

“ Ulcers resulting from congelation generally present the same phenomena as burns. Indeed, parts disorganized by caustics, or by cold, form a gangrenous eschar of greater or less thickness, the removal of which it is necessary to promote by topical applications, supporting the action of parts that remain sound, and at the same time softening the parts labouring under gangrene.

“ The most simple and appropriate means for fulfilling this double indication is the unguent of storax, spread upon linen, or pledgets of charpee, according to the extent of the sloughs. This aromatic and balsamic substance keeps up the action of the subjacent vessels, and mollifies the eschar. Alcoholic liquors and the decoction of bark, which are commonly used in hospitals, have the disadvantage of causing a contraction of the healthy vessels, impeding the purulent secretion necessary to the detachment of the slough, and tanning or rendering it hard, thus preventing its removal and retarding the work of nature. Should the decoctions contain a superabundance of water, they are again liable to give rise to œdema and promote the progress of gangrene. These liquids, moreover, always prove injurious in consequence of their temperature. They are rarely employed at a proper degree of heat, which is speedily lost or increased, through the influence of the atmosphere in the halls, these being of various temperatures. In both cases, disadvantages may result from them. The decoctions then should not be used, except as lotions at the period of dressing the ulcer, should they be indicated. For the preservation of cleanliness, warm water, with soap, or rendered stimulating by vinegar, is preferable.

“ The sloughs having been detached, the sores should be considered simple, and treated as such. The most mild and ordinary means will consequently be the most beneficial. Saffron cerate, spread on fine linen, suffices for the prompt cicatrization of the ulcer. Should the loss of substance be considerable, the pieces of linen may be split and covered with pledgets of fine charpee. The rest of the dressings should be employed in a dry state, and fine charpee be applied to the sore, when the sensibility of the parts is

much diminished. It is necessary to be careful in maintaining the greatest degree of cleanliness in the surrounding parts, and to perform the dressings with mildness and promptitude. This should be done, in order to prevent the ulcer from being seized with hospital gangrene, to which the diseased parts are very much disposed, how little soever the rooms may be impregnated with the putrid miasm. On this account it is useful to cause *guillonnieres* fumigations to be made during the time of dressing the sores.

“ When one or more fingers of an extremity are sphaeculated, or when the limb throughout is in this condition, and when the limits of the mortification are not in relation with the articulations, it is requisite to remove the member at a preferable point between the joints, above the seat of disease. Nature alone cannot separate parts, labouring under necrosis, in the body of the bone. A very speedy union of the wounds, resulting from these amputations, ought not to be attempted, in consequence of the impoverished state of the parts; they should be permitted to inflame and suppurate. The surgeon should content himself with their approximation, by means of a piece of linen, containing a slight layer of the unguent of storax. If the limits of the mortification be at the joints of these appendages, or some part of the member favourable to this object, the operations of nature should be aided by cutting the articular ligaments, for the purpose of extirpating the necrosed bone. The articulation is again closed up, and a cure may take place. In all cases, the progress of these affections should be attentively watched, and in their treatment, those rules adopted which have been pointed out in the Memoirs on Gangrene, inserted in my *Campaigns.*”

I informed the prince, commander-in-chief of the army, and Count Daru, inspector-general, of all our operations during the retreat from Moscow, until our arrival at Königsberg.

On the day following the succeeding one, I had scarcely concluded my arrangements, when I was suddenly seized with symptoms of the catarrhal fever attendant on congelation, a species of typhus having the greatest analogy to hospital fevers. I will, hereafter, describe its principal

phenomena. This malady made rapid progress, and rendered, in a very few days, my situation extremely dangerous. I am indebted for my preservation to the efficacious attention, which was prodigally bestowed on me by my host and respectable friend, M. Jacobi, who, moreover, was not a physician. This intelligent old man knew, from experience, the remedies that were appropriate to this affection, and was acquainted with the proper mode of administering them to me. I rapidly became convalescent, and was capable of leaving my bed, for the first time, on the day preceding the first of the year, 1813.

The precipitate retreat of the Duke of Tarentum was announced on the same day. This marshal marched, in the first instance, on Riga, in concert with Yorck, the Prussian commander-in-chief. But the separation of these two corps induced Marshal Macdonald, to retreat to Konigsberg. This intelligence, reaching the latter city, the hospitals, arsenals, and magazines were quickly evacuated, and arrangements made for the departure of head-quarters. On the ensuing day, January the first, our soldiers entered upon their march from this place. The rear-guard, under the conduct of the Duke of Tarentum, entered Konigsberg on the evening of the second, and the enemy appeared there during that night. I summoned all my strength, in order to commence my journey, and remove myself from this city. M. Doctor Bourgeois, one of my most estimable assistants, from whom I received much attention, accompanied me. I rejoined head-quarters at Elbing. On our passage from Framberg, I was desirous of ascending the observatory of the immortal Copernicus. Extreme debility did not permit me to satisfy my curiosity. The cold, moreover, was still very intense, and the thermometer stood at fourteen or fifteen degrees. On our arrival at Elbing, the cold increased, for two or three days, about two degrees. From the tenth to the eleventh of January, the temperature was somewhat elevated, and the augmentation gradually continued, until our arrival at Franckfort, on the Oder, the tenth of February. The thermometer, however, still indicated in this city ten and eleven degrees below zero. The old men of Russia and Poland declared to us, that they had never witnessed so long and so severe a winter.

Here, properly speaking, terminated the retreat from Moscow. Joachim suddenly left Posen for Italy, and was succeeded in the command of the army by Prince Eugene, who possessed the confidence and friendship of the troops.

My journey from Konigsberg to Posen and Franckfort was attended with nothing of a particular character. I was engaged, in these places, in the improvement of the medical staff of the hospitals, and took advantage of our more than ordinary length of stay at Franckfort, to arrange the notes of my journal, respecting the action of cold. I continued my researches into the direct causes of the malignant fever from cold, the phenomena which characterize it, its results and treatment.

As may be seen in my hasty exposition of our expedition from Moscow, the most cruel sufferings we experienced in our retreat were undoubtedly cold and hunger. The former of these began to assume its intensity on our passage from that part of the Borysthenes in the vicinity of Dorogobouje. It progressively increased, almost without interruption, until we crossed the Niemen, and continued nearly at the same degree, until our arrival at Konigsberg and even Posen. At those periods when the temperature rose some degrees, the snow fell in large quantities, often crystallized in the form of stars with six radii, of different sizes. The same crystalline arrangement and symmetry were observed alike in the small and large stars.

From the time of our departure from Smolensk, where the mercury had already fallen, in the thermometer of Reaumur, to nineteen and twenty degrees, the cold continued between nineteen and twenty-eight degrees, until we reached Kowno. On our arrival at Osmiana, the mercurial column had descended to twenty-two degrees, and during the night fell to twenty-three. On the following day it stood at twenty-four and twenty-five degrees, and during the bivouac at Miedneski, where we passed the night between the eighth and ninth of December, at twenty-six, twenty-seven, and twenty-eight degrees. The cold afterwards varied from twenty-four to eighteen degrees.

The whole army being constantly on bivouac was incapable of avoiding, except with great difficulty, the effects of this sedative and mortiferous agent, which first seized

upon those animals that were destitute of protection. Dead horses were found at every step, and the places at which the troops encamped abounded in them. It was principally during the night that they perished. The soldiers, nearly all of whom were deprived of furs, overcoats or cloaks, were seized with numbness, immediately on their taking the least repose. The younger men, more inclined to sleep, died in greater numbers.

I have remarked, that individuals of a dark complexion, and of a bilio-sanguine temperament, almost all from the southern countries of Europe, resisted the severe cold better than those of a fair complexion and lymphatic temperament, who, with few exceptions, were inhabitants of northern situations. This is contrary to the generally received opinion. The circulation in the former is doubtless more active, and the vital forces possessed of more energy. It is also probable, that their blood preserves much better, even under the influence of the most intense cold, the principles of animal heat, which is identified with its colouring portion. From the same cause, their moral powers are sustained to a greater degree, courage does not abandon them, and by a careful preservation of themselves, they can shun dangers better than the inhabitants (who are in general phlegmatic) of cold and humid climates. Thus we saw the Hollanders of the third regiment of grenadiers, belonging to the guard, consisting of one thousand seven hundred and eighty-seven men, both officers and soldiers, almost totally perish, for there returned to France two years subsequent, but forty-one of the number, comprising the Colonel, General Tindal, who was wounded.* The other two regiments of grenadiers, however, consisting of men who were, with few exceptions, from the southern provinces of France, preserved a pretty large part of their soldiers. It is moreover true, that in proportion to their numbers, the Germans lost more soldiers than the French. Several of our physicians that remained at Wilna, have

* This information was communicated to me by M. Coucourt, a Hollander, *marechal de camp*, who belonged to this corps, and whose leg I amputated in the battle of Lutzen.

assured me, that the cold destroyed more individuals of the coalition, proportionally speaking, than of the French, (as I have already remarked;) though the former had access to a greater variety of means of guarding themselves against the effects of this deadly agent, than our unfortunate countrymen. The latter, deprived of their garments by the Cossacks, and driven from place to place in a state of more or less complete nakedness, did not resist in a less degree the greater part of the injurious effects, resulting from the cold air, and, by dint of courage and industry, obtained for themselves an immunity from total congelation.

On the sixth, seventh, eighth, ninth and tenth of December, there was no bivouac in which several men were not left in a totally frozen state. Some perished even during the march. The periods that proved most fatal were, the days and nights of the eighth, ninth, thirteenth, fourteenth and fifteenth of December. It would be difficult to compute the exact number of dead bodies we observed between Miedneski and Wilna.

The death of these unfortunate victims was preceded by paleness of the countenance, by a kind of delirium, difficulty of speech, weakness of sight, and even entire loss of this sense. In this state some walked to a greater or less distance, supported by their comrades or their friends. Muscular power was sensibly diminished, and these persons staggered, like men under the influence of intoxicating liquors. Their debility progressively augmented until they fell prostrate, which was a certain evidence of the total extinction of life.

The uninterrupted and rapid march of the soldiers in a body obliged those that were incapable of keeping up with the progress of the troops, to quit the centre of the column, in order to resort to the edges of the road, and proceed along its sides. Separated from this compact body, and abandoned to themselves, they soon lost their equilibrium, and fell in the ditches, filled with snow, from which they arose with difficulty. A painful numbness soon seized upon them, and lethargic drowsiness supervening, their sad existence was soon terminated. There frequently occurred, previously to death, an involuntary discharge of urine. In some instances, haemorrhage took place from the nose,

a circumstance that was particularly remarked by us on the heights of Miedneski, which appeared to me to be one of the most elevated points of Russia. I have grounds for believing, that the barometer would have fallen considerably in this high situation. The exterior atmosphere having become rarefied, and the elevation of this region offering no resistance to the action of the fluids, the movements of which are supported by the internal vital powers and the expansion of animal heat, they escape at those points where they meet with the least resistance. It is commonly from the mucous surfaces, and particularly that of the nasal membrane, in which the capillaries are very abundant and susceptible of prompt dilatation, that these discharges take place.*

This death did not appear to me to be attended with much suffering. The vital powers were gradually extinguished, and together with them the general sensibility was removed, and the perceptions of the sensitive faculties lost. It is probable, that the heart was at last paralyzed, and all the vital organs arrested at the same time in the performance of their functions. The fluids, already reduced in quantity by privations, and the absence of caloric, speedily coagulated. We found nearly all of those, who perished under the continued influence of cold, lying on the abdomen. Their bodies were stiff, their limbs inflexible, the skin discoloured, and without any appearance of a gangrenous spot. (I have made known, in a Memoir on Mortification arising from Congelation, the immediate cause of this gangrenous affection. Tome III. *Campagnes d'Espagne.*) Death generally supervened, more or less promptly, according as the individual had been subjected to abstinence for a longer or shorter period.

Not far from the situation in which we endured so ma-

* Madame Blanchard having ascended in her balloon to the height of eighteen thousand feet, became excessively cold, (her thermometer indicated 25 degrees,) and would have perished in consequence of it, had she not, at the same instant, opened the valve of the reservoir containing the hydrogen gas, and had there not occurred a nasal hemorrhage, which speedily took place. See the supplement to the *Institutions Physiques* of Professor Sages, page 224.

ny hardships, in the immense forests of Lithuania, Charles XII. lost also an entire division of his army, in consequence of these two united causes, hunger and cold,

A fact of this kind is contained in Vol. V. of the *Prix de l'Academie royale de Chirurgie*. In 1732, some Dutch travellers, traversing during the winter a part of the Island, were suddenly attacked by such intense cold, that they could not resist it, notwithstanding the precautions they adopted to make themselves warm. Their limbs became stiff, and they experienced acute pains in them. Having lost the power of motion, they remained benumbed, and perished in succession. The last of them thus concludes his journal: "All of my companions have become victims to a miserable death; and I, who am scarcely able to write these words, border on the confines of my existence."

This journal was found, the ensuing spring, by travellers, with the emaciated bodies of these unfortunate individuals.

Instead of recognizing in these phenomena the tonic powers of cold, which many authors attribute to it, particularly the illustrious writer to whom we are indebted for the *Esprit des Lois*,* are we not constrained to believe in its sedative and stupefying influence? Previously to attempting to demonstrate the existence of the latter, let us again report some facts, which will perhaps furnish better proof of such powers.

Alexander the Great, bathing in the river Cydnus during the heat of a summer's day, and in a burning climate, was so much affected by the icy coldness of its waters, that his whole body became stiff and inflexible. The skin was of a livid paleness, and lost its natural heat. He was removed from the river destitute of strength, without the use of his senses, and in a word apparently lifeless. (See *Quintus Curcius*, lib. 3. cap. 5.)

The celebrated professor Bernouilly, from Petersburgh, laving in the Neva, during the intense heat of summer,

* See his System on the Influence of Climates.

was seized with convulsions and drowned, although he could swim.

Prince Poniatowski, one of the most eminent captains in Poland, perished in this manner in the river Heister, on departing from Leipsic. It may be supposed, that, though he was wounded, this general would have reached the opposite shore, had not the water been so intensely cold. Many of our countrymen, who were ignorant of the art of swimming, would probably also have been capable of saving themselves in the passage across the Berezina, if this river had not been on the point of being entirely congealed. (It was frozen on the same night.) The unfortunate individuals had scarcely entered the water, when their members became stiff, and they died in consequence, before being drowned; for some were seen, who had perished in the midst of the flakes of ice, between which they were in some manner suspended.

It is evident, that cold exercises principally its sedative effects on the brain and nervous system. This is strongly proved by the fact, that, on our return from Moscow, those who were destitute of furred caps or had little hair on their heads, were more obnoxious to the cold, the head being more easily deprived of its natural heat. The serous fluids, effused from the internal surface of the membranes of the brain, doubtless coagulated more speedily. Those even, which are contained in the vessels of these membranes and the brain, were rendered liable to lose their fluid character by the diminution of caloric, whence resulted engorgement and compression of the encephalon. The frigorific* effluvia in the atmosphere and the eman-

* Gærtner has pointed out the radiation of cold from ice, extending to ten and twenty steps, when a piece of it was placed in the focus of his concave mirror.

This emission of cold rays is also manifested by the beautiful experiment of Leslie in the vacuum caused by an air pump, when the thermometer falls some degrees. Cold is disengaged in part from ice in the lowest degree of reduced temperature, since, in the space of twenty-four hours, it loses an hundredth part of its weight, as has been observed by Musembroeck. (Remarks extracted from the Supplement to the *Institutions de Physique* of Professor Sages, edition of 1812, page 23 et seq.)

tions that arose from the ice and deep snow, with which the plains of Russia were covered, impeded to a certain extent calorification in the capillaries of the skin and pulmonary organs. The snow and cold water, which the soldiers swallowed for the purpose of allaying their hunger or satisfying their thirst, caused by the irritation of the mucous membrane of the stomach, contributed greatly to the destruction of these individuals, by absorbing the small portion of heat remaining in the viscera. These agents produced the death of those particularly who had become emaciated in consequence of abstinence, and had been deprived of nutriment. In the latter, it was preceded by pains, accompanied with a sense of constriction in the epigastric region, immediate fainting, painful contraction of the glottis, and well marked anxiety, which were symptoms of hunger.

I have remarked, from experience, that a small quantity of good wine, or coffee, removed the hunger, and caused a cessation of its painful effects. I recollect to have spent three entire days without eating or taking any thing, were I to except two or three cups of pure coffee, without sugar, when a friend gave me a glass of Bourdeaux wine, which I drank with indescribable pleasure. From this moment disappeared all the symptoms of hunger, to which I had been exposed for many hours. *Famen vini potio solvit.* (*Hipp. Aph.* section II. aph. 21. edit. by Demercy.) The horses, particularly, having eaten snow, speedily perished. In order to preserve them, the snow, or ice, was melted at the fires of the bivouacs, where they had vessels proper for this purpose, and a small quantity of this water was given them. Since our return to France, we have seen many persons, who were in the expedition from Moscow, labouring under hemiplegia, depending, evidently, on a kind of incomplete and partial disorganization of the brain. We would report the cases of a majority of these patients, were we not fearful of being prolix.

Unfortunate was the fate of him, who, with his animal functions nearly annihilated, and his external sensibility almost destroyed by the cold, should suddenly enter too warm a room, or approach too nearly a large bivouac fire. The projecting parts of the body, grown insensible, or being frozen, and remote from the centre of circulation, were

attacked with gangrene, which manifested itself at the same moment, and was developed with such rapidity, that its progress was perceptible by the eye, or else the individual was suddenly suffocated by a sort of turgescence, apparently invading the pulmonary and cerebral systems. He perished, as if in a state of asphyxia.

In this manner died M. Sureau, chief-apothecary to the guard. He reached Kowno without accident, being merely debilitated by the cold and abstinence. A retreat was offered him in a very warm medicine apartment of the hospital. He had scarcely spent some hours in this atmosphere, to which he was a stranger, when his limbs, no longer possessed of any sensibility, became tumeified and swollen, and he soon expired in the arms of his son, and one of his assistants, without being capable of uttering a word.

Persons were seen to fall dead at the fires of the bivouacs. Those, who approached them sufficiently near to warm their frozen feet and hands, were attacked by gangrene, in all points where the vital powers had been reduced. These fatal occurrences, mutilating the majority of our soldiers, threw them into the power of the enemy. Imagine, if it be possible, the sufferings and miseries which must have been experienced by these unfortunate prisoners, dragged or transported, with little care, from Poland or the frontiers of ancient Prussia, to the most distant parts of Russia!

The French, Portuguese, Spaniards, and Italians, were again those, from whose ranks was derived the smallest number of victims to these cruel reverses. This is a new argument against the assertion of the author of the *Esprit de Lois*, a new proof, that the inhabitants of these southern countries have more energy and power to resist the action of cold, than those of northern locations. Agreeably to the report of several physicians and surgeons, who participated in the fate of our soldiers, and were conveyed with them to Siberia, nearly all the individuals belonging to our allies from Germany, Hanover, and Holland, perished at an early hour. Some Russian troops and Poles, however, resisted these calamities much better. But, as I have remarked in my campaigns when speaking of it, this

latter nation originated in Asia Minor,* and, according to this report, must have great similitude of physical constitution and character to the inhabitants of the southern countries of Europe, such as the French. Thus, whatever may be the governments and laws, under which the inhabitants of southern countries live, they will always be superior in activity, moral energy, and physical constitution, to those, whom cold and permanent humidity must, by restraining their energies, keep in a constant state of apathy, indolence, and a kind of timidity. Spain furnished us a signal proof of this truth. The conduct pursued by it demonstrates, in an undeniable manner, the error of Montesquieu, which has already been rendered notable by the bishop of Fernambouc, member of the Academy of Sciences, of Lisbon. (See the *Décade Philosophique*, No. 22, Year Eleventh.)

Doctor Mestivier, who lived several years at Moscow, assured us, that the French alone could walk, with impunity, in the streets of that city, during the most intense cold of winter, with a simple great coat over their other garments, whereas the inhabitants could scarcely withstand the severe weather, although they were covered with furred cloaks.

It will easily be conceived, after what I have just said, why, in mortification of some external part of the body, caused by cold, instead of submitting it to heat, which provokes gangrene, it is necessary to rub the affected part with substances containing very little caloric, but which may absorb a good deal at the moment of their melting, and transmit it to the frozen part by rubbing. For it is well known, that the effect of caloric on an organized part, which is almost deprived of life, is marked by an acceleration of fermentation and putrefaction. Before pointing out the means to be employed, let us succinctly describe the symptoms which characterize congelation. The part labouring under this affection is whiter than other parts of the surface of the body; all its sensibility is extinct, and the individual has no longer any sensation in it.

Snow and ice are the substances, to which recourse

* The same observations are applicable to those dwelling in the provinces bordering on Turkey and Asia, as the majority of the Cossacks.

should be had, for the first application. Dry frictions also, are very serviceable, and should always be made with substances which possess but little heat. I employed no other means for defending myself from gangrenous affections, which would at least have taken place in my toes and fingers, for they were frequently deprived of all sensibility. In this state, I took care to rub the affected parts with snow, and continued, as much as possible, the use of these or dry frictions.

Should these remedies fail, the part ought to be plunged in cold water, in which it should be bathed, until bubbles of air are seen to disengage themselves from the congealed part. This is the process, adopted by the Russians, for thawing a fish. If they soak it in warm water, they know, from experience, that it will become putrid in a few minutes; whereas, after immersion in cold water, it is as fresh as if it had just been caught. It is still necessary to sustain, as far as practicable, the powers of the stomach and lungs.

No internal maladies had as yet developed themselves in the army, notwithstanding the fatigue, privations of every kind, and excessive cold, to which it was subjected. The soldiers were not necessitated to stop on our route, except in consequence of partial congelations of the feet and hands. Patients, labouring under affections of this character, were those only, whom we found among the wounded in the hospitals, on the line of evacuation, between Moscow and Konigsberg. But having reached ancient Prussia, where the army enjoyed some days of repose, had access to aliment, placed at their discretion, and were provided with warm rooms, the majority of the soldiers, who had fortunately withstood the fatal effects of cold and hunger, were almost suddenly attacked with a disease, which we will designate by the term of *meningeal fever, catarrhal in its nature*, arising from *congelation*. This affection assumed, in a few days, an epidemic character, and having reached its third stage, became contagious, particularly when complicated with a gangrenous state of the extremities.

We will attempt an explanation of the causes of this sudden change in the health of the troops.

During the whole period of our subjection to the influ-

ences of cold from eighteen to twenty-eight degrees, in a rarefied atmosphere, and to an almost continual abstinence from nourishing aliment and potable drinks, possessing greater or less tonic powers, we all experienced, in different degrees, a state of sedation on the exterior, and a gradual diminution in the diameter of the intestinal tube. This condition was attended with general emaciation, and a tendency, in consequence of the want of equilibrium, to expansion of the capillary vessels of the internal membranes, in which latent heat and life appeared to be concentrated. A stay, prolonged for a greater or less length of time, in apartments warmed by stoves, augmented sensibly this vascular expansion, giving rise to engorgement of the membranes, particularly of the meninges and mucous membrane of the air-passages. These two principal effects were announced by compressive pains in the head, accompanied with heaviness, injury of the mental faculties, and alteration in those of the sensual organs. The patient was seized with general debility, and extremely painful anxiety. Cough manifested itself, and rapidly augmented. It was more or less violent, and attended with a mucous, and occasionally a bloody expectoration. There frequently supervened, at the same time, diarrhoea, with an inclination to vomit, and colicky pains. The pulse was febrile, the skin dry, and the patient experienced a painful numbness in the limbs, cramps, convulsions, and a stinging pain in the soles of the feet. The patient slept with difficulty, and was subject to sinister dreams. The vessels of the conjunctiva were injected. Paroxysms of fever were manifested during the evening. The pulsations of the carotid, and temporal arteries, became sensible to the eye, and delirium, or lethargic drowsiness was established, and the danger of the sufferer became imminent.

Such are the principal symptoms, that accompanied this affection, which may be called *catarrhal ataxia arising from congelation*. Its progress varied in rapidity, according to the constitution, age, and emaciation of the patient. Many circumstances influenced the intensity of these phenomena.

When the affection would eventuate favourably, the inflammatory stage was of short duration, and ordinarily

terminated by nasal haemorrhages, or by a momentary dysentery, which supervened from the fifth to the ninth day. This formed a crisis to the disease, and saved the life of the patient. Instead of a discharge of blood from the mucous membranes, there sometimes occurred profuse sweats of a brownish hue, staining the linen of the individual. These phenomena bear much analogy to those, that are observed in scorbutus acutus.

Should the issue, on the contrary, manifest its fatality, the symptoms indicative of apoplexy were developed and progressed with rapidity. The body, particularly the lower extremities, was covered with erysipelatous spots, which soon assumed a gangrenous character. The urine, of a dark colour, became scanty; the alvine evacuations foetid and black. All the functions were successively annihilated, and the patient died before the fifteenth day, or even at an earlier period, did he discover his danger, and had the disease been preceded by much anxiety previously to his becoming delirious.

General Lariboissiere furnished a sad example to this effect. After having borne, quite successfully, the hardships of the campaign of 1812, he very speedily became a victim to this affection, after reaching Konigsberg. This brave general had witnessed the death of his son in the battle of Mosaisk, and to this cause of personal grief were added the sincere regrets, in which he had participated in common with all men of sensibility, for the loss of the army. General Eblé, so celebrated for his warlike talents and virtues, succeeded him in the command of the artillery; but being attacked by the same disease, he soon after experienced a similar fate. How many others of our noble companions followed the destiny of these victims, at the moment of their reaching their native soil!

In the inspections of the dead bodies, which I frequently had an opportunity of making, a white layer of albuminous substance, unconnected with any suppurating point, was found on the surface of the brain. The sinuses of the dura mater were filled with black coagulated blood. The encephalon was compressed, its tissue more dense than in ordinary cases, and its vessels injected with dark coloured blood. The mucous membrane of the larynx and bronchia

was of a blackish brown tint in some parts of its surface, the intestines considerably shrunk, and the omenta scarcely observable; the latter was the result of abstinence. Gangrenous eschars were perceived in almost every instance, in the inferior extremities and abdomen.

This typhous fever, with which I was attacked, as I have remarked, a few days subsequent to my arrival at Konigsberg, and succeeding my long and tedious visit to the numerous hospitals of this place, came on with symptoms, at first slight, but afterwards becoming so developed as to augment progressively in intensity until the seventh day. The fever was then at its height, the pains in my head extreme, and delirium began to supervene. Having unavailingly entreated that I should be bled from the jugular vein, a pretty copious haemorrhage took place from the nose, by which these symptoms were dissipated, and the danger of my situation removed. A mild emetic, afterwards administered to me, and embrocations with camphorated vinegar, which I caused to be frequently made over the whole surface of the body, together with an infusion of bark, taken in the morning, and the use of good wine, coffee, and broths, gradually liberated me from this malady. I was fortunately capable of following the movements of the army, on its departure from Konigsberg, January 2nd, 1813. My convalescence was long and tedious.

Agreeably to the exposé of these phenomena and my own experience, the following remedies are, I think, to be generally preferred in the treatment of this disease. 1st, In the stage of cerebral and mucous congestion, it is necessary to apply cups with scarifications to the temples, head, and back of the neck. It is always beneficial to shave the head of the patient for the purpose of making these applications, and those which may succeed them.

If the symptoms of congestion continue after the employment of the cups, leeches should be applied to the scarifications, or else one of the jugular veins or temporal arteries should be opened. The application of the skin of an animal flayed alive, or of a pigeon emboweled, while living, may be here advantageously applied to the head. The efficacy of these topical remedies in violent contusions have been pointed out in my campaigns of Newfoundland

and Spain. Good effects may also result from the employment of ice in small pieces on the head after the local bleedings; but circumspection is necessary in the use which is made of it. Pediluvia, sinapisms to the feet, and embrocations with camphorated vinegar over the whole surface of the body, at such a temperature as is indicated by the state of the skin, should be resorted to in conjunction with all these means.

2nd, When the inflammatory symptoms are dissipated and marks of a gastric sabrall affection are developed, a favourable moment should be selected for the administration of an emetic, composed of a strong filtered infusion of ipecacuanha (made cold) and a small portion of tartar emetic. It is an excellent remedy, when suitably given.

3rd, Subsequently to cleansing the primæ viæ, the patient should be placed on the use of mild tonics and nutritive substances imparting strength, such as bark infused in wine, or a mild decoction of serpentaria or chamomile, vinous, theriacal and ethereal potions. Broths, rendered aromatic by the addition of cinnamon, together with wine and some cups of coffee, should be administered in the evening.

The individuals, who laboured under this disease, were for a long time in a state of convalescence, in consequence of the prolonged abstinence, to which they had been subjected. The intestinal canal, as we have observed, had contracted considerably, and only returned to its primitive state in a slow and gradual manner. Nutrition and the restoration of strength were tardily effected, as the slightest deviation in diet speedily gave rise to relapses, and the least excesses in eating caused colics and painful twitchings throughout the abdomen. The patient was necessitated to eat often, and take little at a time. A girdle was also drawn tightly around the abdomen. This convalescence was succeeded, in many cases, by the loss of the hair from the head, and from all other parts of the body. But a singular phenomenon was presented in the person of surgeon-major Adorne, one of my assistants, whom I saw at Konigsberg during the prevalence of his malady, and whom we found in France on our return. I refer to the falling off of the nails on the hands and feet, which are subsequently regenerated, as is the case with all the pilous parts of the body.

This disease made great ravages in the first cities of Poland and ancient Prussia, where many of our companions were obliged to stop on account of fatigue and congelation of the feet.*

During our stay at Posen, Prince Eugene, commander-in-chief of the army, was presented by me with an account of every thing that had occurred, having reference to my staff, between Konigsberg and that city. On reaching Franckfort, I commenced a circumstantial report to the minister at war, relative to the surgical department, during the retreat from Moscow. This report described succinctly all we have said concerning the *ambulances*.

The Russians having crossed the Oder on the ice, and

* On our return to France we saw a pretty large number of soldiers, especially those of the junior guard, who had made the campaign, affected with concretions, forming flattened tumours of greater or less extent, in the cellular tissue, and skin of different parts of the body, particularly the face, neck, and shoulders. The limbs and rest of the surface of the body, in a few of these soldiers, had become hard, so as to resemble very much the firm consistence of newly born children. One of the individuals labouring under this affection was conveyed to the rooms appropriated to the wounded; he was aged twenty-seven years. His body was very much inflated, and no impression could be made on it by the finger. This tumefaction was more evident in the face, shoulders, and arms, than in other situations. The surface of the skin was rough and dry. The patient was oppressed, his pulse scarcely to be felt, and the pulsations of the heart were with difficulty perceived, even when the ear was placed to the chest.

It was without avail that we employed, in opposition to this malady, dry cups and cups with scarifications on the thorax and sides of the vertebral column, in conjunction with moxæ to the same parts, mucilaginous and diaphoretic drinks, vapour baths, etc. After a continuance of this treatment from five to six weeks, this young soldier died, having previously lost, for some hours, all the phenomena of the circulation of the blood.

On examining the body, we found the skin considerably thickened, and containing in its substance parts resembling lard. The cellular tissue had also become more dense, and was filled with yellowish albuminous concretions. The lungs were destitute of crepitation, and reduced to a very small size. The heart was in a state of atrophy, and devoid of blood. An albuminous concretion only, of a yellow colour, was found in the right ventricle; it extended towards the orifice of the pulmonary artery. The liver was very voluminous, and suppurating tubercles were disseminated through its substance. The other viscera presented no marks of a pathological condition.

interrupted our communications with Berlin, we were necessitated to continue our retreat to the Elbe. On this account we left Franckfort the twenty-second of February, directing our march to this capital, after having surmounted the obstacles with which we met. From Berlin we moved on to Wittemberg, and afterwards to Leipsic.

On reaching the former of these cities, I visited the temple, which contained the tombs of Luther and Melancthon. The full-length portraits of these two theologians presented a striking contrast. That of Luther indicates an orator, animated by an ardent imagination, and excited by a noble enthusiasm for the doctrines which he successfully preached. He was observed to have been of the ordinary stature, to have possessed embonpoint, an highly coloured face, a sharp and sparkling eye, black beard, and a high and open forehead. The physiognomy of Melancthon bore a strong resemblance to that of my celebrated master Sabatier, and it is a very singular circumstance, that there should be a perfect resemblance between the hand-writing of these two illustrious men. Melancthon, like Sabatier, was small in stature, thin and withered. His appearance was that of a man, who has spent his whole life in study and meditation. His large protuberant forehead and very broad head indicated exalted intellectual powers. He possessed the eye of a man of genius. Labour and application seem to have marked out the wrinkles, which were observed on his face. An individual on viewing these portraits would be inclined to believe, that the artist had executed a perfect resemblance, and could judge without difficulty, that one of these celebrated personages composed sermons, and that the other delivered them. But all the honour of these productions is concentrated in the person of Luther, as being him whose image has made a deeper impression on the minds of the auditors.

We proceeded from Wittemberg, where we crossed the Elbe, to Leipsic, and entered it on the ninth of March. This was the first place, at which we supposed the campaign to be concluded; a repose of some months duration, was indeed announced. We were well received here, and treated with perfect politeness. The inhabitants were mild, affable, and generous, the city in itself very agreeable, and its

environs delightful, particularly in fine seasons. These advantages were of infinite value to me, but I did not prize less the important means of instruction, offered by this city. Among others, were the anatomical cabinet, possessed by the university, and the observatory, which contained some excellent telescopes. The specimens in the former were few in number; but there were some well made, and extremely delicate preparations of the nerves of the face and head, than which nothing could be more exact and elaborate. The most minute nervous filaments with the smallest anastomoses were preserved and evidently demonstrated. To these dissections of the nerves might be compared some beautiful preparations of the lymphatic vessels. The portrait of Plathner was observed in this cabinet; his countenance bore the mark of the genius and profound wisdom, which rendered him distinguished among the men of his age.

We were entertained in the observatory with the passage of a comet, which presented itself at the end of October, 1812, by the astronomer who exhibited to us, through the telescope, the most visible stars, and particularly the surface of the moon. I saw the same comet, when crossing the Berezina, November twenty-fourth, of the same year. Agreeably to the journals, it appeared in France from the twenty-first of September, until the ensuing October. It exhibited itself under the form of a cloudy spot, without tail or beams. From the observatory of Leipsic, a vertical beam was apparently attached to this phenomenon, during the latter part of October, contiguous to the Great-Serpent, and extending to the north-east. In consequence of some urgent repairs, to be made in the observatory, its course could be no farther followed, nor could it be longer observed. These particulars were given to me by M. Speisner, observing astronomer of Leipsic.

During our stay in this city, I addressed to the minister at war an appendix to the report I had already made to him, for the purpose of acquainting him with all that had occurred in my staff between Franckfort and this place.

I continued my researches into, and observations on, the reigning malady, the catarrhal malignant fever of *congelation*; its contagious or pernicious effects had spread

among the inhabitants. The mortality was considerable, and many individuals perished also in the cities of Prussia, where the army in its passage left a large number of sick. I received, at Leipsic, a letter in reference to this disease, the progress of which was attended with great alarm, from the head of the *état major*, written in the name of the commander-in-chief. My report, while removing the disquietude of the prince, pointed out the hygienic measures to be adopted for impeding the developement of this fever, for arresting its progress, and preventing its contagious influence.

We had scarcely spent fifteen days in this place, when we were menaced on all sides by the enemy, who had already seized upon Upper Saxony. This circumstance rendered our position insecure, and it became expedient also to prevent the blockade of Magdeburg, the provisioning and fortifications of which for a seige were not completed. On this account, the Prince was induced to leave Leipsic for the purpose of repairing to Magdeburg, where we arrived in a few days. At Halle, in which place I stopped twenty-four hours, in order to cause our patients in the hospital of this city to be removed, I had the pleasing gratification of becoming acquainted with the son of the celebrated Meckel, whom I had not seen since my arrival in that place during the first campaign in Prussia. This young and learned professor exhibited to us a very beautiful and splendid set of anatomical preparations, made for the most part by his father. Nearly all of the specimens were dry. They consisted of injected capillary vessels of the osseous system and serous and mucous membranes of such a degree of perfection, as has been reached by very few anatomists. Some beautiful mercurial injections of the lymphatic vessels, and other particular specimens, moreover, attracted my special attention.

We entered Magdeburg during the latter part of March, being threatened towards Prussia by numerous troops, which approached the advanced posts of our fortifications. Prince Eugene crossed the river, April the second, with his army, composed of from twelve to fifteen thousand men, and moved on some leagues in advance. A corps of Prussians of about thirty thousand men presented themselves, but retreated

immediately on seeing our troops, with the view of effecting their passage across the river at a more remote point. The movements of this corps were observed for some days, and arrangements were made for a return to Magdeburg, where our advanced guards were secretly attacked, during the night between the sixth and seventh, by superior forces. A battle ensued, which placed about two hundred wounded in our hands; they were conveyed to the hospital of the city, which was a very short distance off. It was, moreover, impossible to dress their wounds on the field of battle. In connexion with these injuries, some interesting facts presented themselves, of which I shall have occasion to speak in other articles.

Prince Eugene, being well convinced that the Prussians had passed the river, and effected their junction with the Russians in the vicinity of Leipsic, departed from Magdeburg in order to establish his line of operations on the Saale, after having adopted all the necessary measures for the defence of this place. By virtue of his orders, I took such steps as were in my power with the view of rendering secure the duties of the hospitals, and was momentarily detached from head-quarters for the purpose of visiting the *ambulances* and hospitals in the neighbouring situations. Among these was Halberstat, where I spent several days; I rejoined head-quarters at Mersburg. On reaching this latter city, April the thirtieth, the advanced posts of our army engaged in battle, and we had from five hundred to six hundred wounded, whom I caused to be dressed and operated on in the hospital which we had established in this city.

PART THE FIFTH.

MOVEMENTS were made by the allies for some days, with the view of cutting off our small army, and moving on in front to the frontiers of France. But their march was arrested by the arrival of Napoleon, who at the head of fresh troops effected a junction, on the first of May, with those commanded by Prince Eugene in advance of Mersburg. From this period the two *états-majors* were reunited, and I received an order to rejoin the grand head-quarters at Lutzen. Leaving Mersburg with the light *ambulances* during the night between the first and second of May, we arrived at Lutzen on the morning of the second at eleven o'clock. A violent cannonade was already heard to the right of our army, and very active measures were in preparation with both parties for a grand battle. It commenced indeed a few moments subsequently with great violence along the whole line. The commander-in-chief observing me while passing through the troops, came up and personally addressed his orders to me: "You have arrived at a very proper time, said he; go into the city and select the necessary places for the reception of the wounded in the combat at hand, and adopt measures for affording them all the requisite succour."

Having determined upon the situations of the *ambulances*, and arranged every thing for dressing the wounded, I returned to the field of battle for the purpose of observing the first effects of the fight, and placing the *ambulances* of the first line, which I took for the most part from those of the guard.

The attack on both sides was very spirited, and, for whom victory would decide, was a matter of doubt for some moments. Our young soldiers, however, excited by

the examples of valour before their eyes, and by the presence of the emperor, rushed impetuously against the columns of the enemy, which they broke through and dispersed. Victory rendered us masters of the field of battle, and placed at our disposal a large number of prisoners, pieces of artillery, and a great part of the baggage of the enemy. The remainder of the allied army retreated precipitately to Dresden, in which place it made no halt. These troops contented themselves with cutting down the bridge across the Elbe, in order to give themselves an opportunity to rally and to take a stand on the heights of Bautzen.

The field of battle at Lutzen was covered with the dead and the dying, of whom the majority had belonged to the Prussian ranks. We caused all the wounded, as well of the French as the allied army, to be collected together, and located them in the small city of Lutzen, which was almost totally filled with *ambulances*. We were occupied during the first two days and nights in dressing their wounds; nearly all the difficult operations were performed by myself. Among the amputations of the leg executed immediately below the knee, I will cite that of Brigadier General Chemineau, as the most remarkable of the kind. The leg had been disorganized by a bullet of large size, as high as its superior part. Being intimately persuaded, that the articulation was not injured, I entertained a hope of preserving this part by amputating through the head of the tibia, though the injury extended to a point very contiguous to it. I marked out the course of the amputation with my eye by a line extending from the summit of the insertion of the ligament of the patella to the head of the fibula. Having cut the soft parts on a level with this circular line, I dislocated the head of this bone and sawed through the tibia even with this articulation. But how great was my surprise and that of my assistants, when we observed a fracture separating longitudinally the head and extending to the knee joint! We were inclined to amputate the thigh, when, after having reflected on the internal state of this articulation, in which there was no evidence of effusion, we concluded that the fracture did not penetrate into it, and that the operation would be followed by success. I

therefore approximated the fractured parts, and maintained them in their relative apposition by means of a bandage of moderate tightness. The patient experienced some constitutional disturbances, which were successively dissipated, and his recovery was perfect. This conclusively decides the question of the advantages of this operation when compared with that performed on the thigh, even when the injury is contiguous to the knee, and in the event of the head of the tibia being fractured, provided the soft parts are uninjured. I should prefer executing the operation in the knee-joint to ascending the thigh for this purpose. The same treatment would not be pursued, should the condyles of the femur be fractured; amputation of the thigh in this case is indispensable.

Eighteen amputations of the arm at the shoulder, presenting many varieties, were performed. In all the wounded, the injury of the arm extended as high as the shoulder, at which the operation took place. My method was employed in every instance with the greatest advantages. The reports, which I received subsequently from the surgeons of the hospitals in Leipsic, and other cities in the line of evacuation, informed me that all the wounded, with the exception of three, were restored to perfect health.

Having caused all the French and foreign patients to receive the primary attentions, I secured to them the benefits of medical aid by placing them under the care of the requisite number of surgeons, to whom I gave the necessary instructions for their removal and consecutive treatment. Preparations were hastily made by me to rejoin head-quarters, which I could not overtake but at Colditz, where the army had halted. Here the enemy might have waited for us in security; for this small town commands a defile between pretty high mountains, through which it is very difficult to pass. An *ambulance* was established at the general hospital, as being very spacious and well built. All the individuals of the province, labouring under chronic diseases or incurable infirmities, were received into it. Among the latter, we observed some *Cretins*, particularly females, who bore a strong resemblance to those I saw in the *Maurienne* valley in Savoy.

The regulations of this establishment were remarkable for certain usages. The livery of the infirmary servants was peculiar and singular. Their clothing comprising stockings, consisted of two colours, one half being yellow and the other dark violet.

We reached, in a few hours after leaving Colditz, the hills bordering on the left bank of the Elbe, from the tops of which were seen the capital of Saxony, and the mountains of Bohemia. The prospect was magnificent, and extremely variegated. The advanced soldiers of the vanguard soon apprized us, that the troops of the enemy had not halted in the city, and that after evacuating it, they had destroyed the bridge. On receiving this intelligence, the head-quarters and the guard entered the place, and the different corps encamped in its environs. I visited immediately all the hospitals and establishments, which were filled with wounded, as well Russians as Prussians. The former had been dressed, and all the operations required by their wounds performed. But the subjects of these operations appeared to experience intolerable pains. I requested the Saxon surgeons, under whose charge they were, to exhibit to me some of the stumps resulting from amputation. I had previously imagined, that sutures had been employed according to the method generally adopted in Saxony, and some parts of Prussia and Poland. And indeed, in the stump of each of these unfortunate and mutilated individuals, we found two, three, and four points of suture, protected by adhesive plasters, tightly applied. Irritation and inflammation had already been developed in every case, with different degrees of intensity. I advised the Saxon surgeons to cut the sutures, remove the adhesive straps, and apply emollients to the stumps. They did not, at first, accede to my proposition, observing, that this disturbance was transient, and that these symptoms would not impede the recovery of the patients. It was my duty to respect their opinions; notwithstanding, however, I took it upon myself to remove a dressing of this character, from one of our officers of artillery, who had been conveyed from the field of battle at Lutzen, with the view of being carried to Dresden, and had undergone the amputation of his thigh. This patient experienced very great relief

subsequently to the removal of the dressings ; but irritation was very far advanced, and it was impossible to prevent gangrene, which, having already manifested itself in the interior of the wound, made rapid progress, and caused the death of this officer on the third or fourth day. All the others, upon whom amputation had been performed, died, without exception, in the same manner, some at an earlier, others at a more remote period. As there were still many wounded French, who required amputation, I caused them to be operated upon by the surgeons-major of our *ambulances*. Those of the most difficult character were performed by myself, in the presence of the Saxon physicians and surgeons, who were soon capable of distinguishing our method of amputating from that employed by themselves, and did not hesitate, as to the adoption of this plan, evidently so advantageous. The Saxons divided the skin and muscles by means of a curved knife at one stroke, and the bone nearly on a level with the section of the soft parts. The tourniquet exercising a strong compression on the arteries, the wound was sewed up without the application of ligatures to the vessels. The exact and close union of the edges of the wound generally prevented haemorrhage. Notwithstanding the simplicity and reasonableness of the French method, nothing less than experience and the success obtained, could convince the physicians of the country of its utility, who, in other respects, were very estimable for their social qualities, and distinguished merit.

The progress of the army was arrested for some days on the left bank of the Elbe, in awaiting the construction of two bridges of boats, and the reparation of the stone bridge, the principal arch of which had been destroyed. I took advantage of this delay to organize the divisions of our light *ambulances*, and to have manufactured some surgical instruments, which were wanted. Lessons in clinical surgery were also given by me over those of the wounded, who were in a condition to endure an operation of greater or less importance.

The bridges being completed, the troops effected their passage in succession. Head-quarters and the guard, whose movements I constantly followed, departed from Dresden on the nineteenth of May, and we reached the heights of

Bautzen on the twenty-first. Information had already been communicated to us, that the enemy had entrenched themselves to the east and south-east of this city on a range of circular hills, which were lost insensibly in the chain of mountains, bordering on the frontiers of Bohemia. The heads of the columns, in reconnoitering the enemy's lines, engaged in battle; but the combatants were separated by the bad weather and the approach of night. We secured surgical assistance to the wounded in this fight, and continued our preparations for the battle of the following day, which to us appeared inevitable. Passing through Bautzen on the evening of the twenty-first, I caused different places to be arranged for our *ambulances*, and confided the general direction of these establishments to M. Fabre, adjunct-surgeon-in-chief. At the dawn of the following day, I proceeded with the light *ambulances* to the field of battle. The attack had been commenced simultaneously by both armies, and had been conducted by each in a very spirited manner. Several of our battalions had already tottered under the impetus of the allies, who would probably have obtained some successes, but for the skilful and rapid movements of our generals. Under their direction our troops soon cut off the progress of the enemy's wings, broke through the centre, and carried the principal redoubts, which were scaled by our young soldiers, with unparalleled intrepidity. The French soldiers had not exhibited such ardour, since the campaigns of 1792, 1793 and 1794. They surmounted all obstacles and gained a signal victory, which resulted in the capture of a line of redoubts, established on the heights of Wurchen, forty pieces of cannon, waggons, baggage, and a pretty large number of men. We had about six thousand five hundred wounded in this combat, both of the line and guard. Having administered the primary succour on the field of battle to those whose necessities were most urgent, I proceeded to the city in company with the majority of my assistants, for the purpose of continuing our services to those there located. I spent the first three days in having their wounds dressed, in conjunction with my estimable colleague, M. Fabre. My care was bestowed especially on Generals Laurancé, Laboissière, and a large number of officers and

soldiers, whose wounds required operations of greater or less difficulty and importance. The first was labouring under a fracture of the condyles of the left femur immediately above the knee, without any solution of continuity whatever in the soft parts. It was caused by the shock of a spent cannon-ball. There also existed a simple gunshot wound in the right thigh, though the bullet was buried in the flesh. Having dressed this latter wound, I prepared, with the assistance of M. Fabre, for paying the requisite attention to the fracture of the left thigh. An eighteen tailed bandage, made and applied with care, preserved the straightness and proper conformation of the general's limb. This case, extremely serious in its character, was one of those, in which it is very difficult for the surgeon to decide; the patient however recovered. The second individual had received in his left leg a fragment of a bomb from an howitzer, which had removed a part of the tibia a short distance from the maleolus. I postponed the amputation of the limb, which appeared indispensable. This general was so fortunate as to preserve the member; but it remained somewhat deformed, and shortened about the breadth of two fingers. I removed the arm at the shoulder in the persons of the following soldiers: Louis Jérôme Brigot, soldier of the eighty-eighth; Léonide Staure, soldier of the hundred and fifty-first; Dominique Lem, sergeant of the thirty-second; Jean Brigod, of the seventy-fifth; Delauzanne, soldier of the hundredth and thirty-sixth; Fourchartre and Gilbert, cannoneers of the second of artillery; Raymond, fusileer of the hundredth and second; Antoine Turios, of the third light troop. All of these individuals, without exception, were cured. Several partial amputations of the foot were also performed, and resulted in as fortunate a manner.

The army contending constantly with the enemy, whom it pursued with the utmost vigour, I received an order from the Emperor Napoleon to rejoin the troops in all possible haste. The adjunct surgeon-in-chief remained in Dresden, having under his charge these wounded patients, whom he attended until their removal.

On my arrival at head-quarters, a short distance from Hainaut, I learned the sad intelligence of the death of Generals

Kirchener and Bruyeres, and of the mortal wound of Marshal Duroc, Duke of Frioul. This general frequently demanded my presence, and was looking for my arrival with extreme impatience. He had been conveyed to the house of an inhabitant of the village where he was wounded. On entering this cottage, in which I found the marshal lying on a pile of straw, and still clad in his uniform dress, I was seized with terror at seeing him labouring under a mortal injury. My sinister presentiments were too soon realized. He could scarcely articulate a few words. The consequences of his wound were perceptible through the dressings which covered it, and the pallor of death was stamped upon his countenance. The parietes of the abdomen had been removed by a ball of large size, the intestines lacerated in several parts, and protruded from the abdominal cavity. I saw, with the most acute grief, that all the succour of our art could not rescue him from the speedy and inevitable death, which was approaching. Indeed, in a few hours subsequent, this general officer, one of my honourable companions in Egypt, terminated his brilliant career. His name, and those of Generals Desaix and Lannes, are deeply impressed on my heart, in gratitude for the friendship constantly manifested for me by these illustrious and exalted warriors.

On reaching Hainaut, we found three hundred and sixty persons, who had been wounded in an unfortunate combat on the heights of this city, involving one of our divisions, which was surprised by a numerous body of the enemy's troops. Among them were three female sutlers, and two children. In the case of one of the former, a sabre, after removing a portion of the left parietal bone, had cut the dura mater, and the cortical substance of the brain. I bestowed my services upon her, as upon all of the patients, and recommended her, with her companions, to the care of the surgeon-major of the hospital. Information of her recovery has since been communicated to me. Three amputations of the arm at the shoulder, and some other important operations which I performed, likewise eventuated in the most successful manner. The majority of these patients were removed to Dresden, and those that were incapable of being transported, were located toge-

ther in an hospital established by us at Hainaut. These accidents did not arrest the march of our army, and the enemy was pursued with much spirit by our troops. They could have been repulsed beyond the Oder, where we could have repossessed ourselves of the garrisons, which had been left in this situation. These consisted of excellent troops, and were capable of compensating for greater losses than we had sustained in the battles of Lutzen, Bautzen, and Wurchen. But having arrived at Neumarck, ten leagues from Breslau, the French accepted of an armistice, and the preliminaries of peace that were proposed to them. Each army then took stated positions, and we returned to Dresden. During our short stay at Neumarck, a small city inhabited by Jews, we suffered from the want of good food, the inferior quality of the water, and the inclemency of the season, which was rainy. These circumstances occasioned an obstinate diarrhoea and hepatic affections in a large number of our soldiers. Many of our horses were destroyed by a singular affection, *le vertigo*, which these animals contracted doubtless, under the influence of this humid and very unhealthy climate, and in consequence of their drinking the waters of marshes, which were both muddy, and filled with insects or animalculæ.

I accelerated my progress in order that I might have an opportunity of revisiting the wounded in Bautzen. Two-thirds of them had been conveyed to Dresden by the inhabitants, who, highly zealous and humane, and in conformity with my advice, had employed for their removal a kind of wheel-barrow, very commodious and much in use in the country for the transportation of wares and merchandise. Each private man had several of them. The road from Bautzen to Dresden being throughout a descent, the progress of these means of conveyance was not at all impeded. We saw as many as a hundred and a hundred and fifty moving in succession. No method of transportation could have been more convenient or expeditious. This circumstance proves how important it is for a surgeon-in-chief to study the countries through which armies pass, in order that he may be capable of converting to the advantage of the wounded the resources presented in different localities.

Tetanus supervened during the first stages of these wounds, and attacked more especially those individuals whose injuries were connected with fractures of the joints and limbs, and loss of substance, together with a large number of those whose thighs had been amputated. All that were subjected to this cruel malady, with the exception of one, succumbed to its destructive influence. This patient, who was wounded in the foot, was indebted for his preservation to amputation of the leg, performed at the period of the invasion of the first tetanic symptoms. The extirpations of the arm and amputations of the leg in general eventuated fortunately. I had an opportunity of observing some wounds of the head, which manifested singular phenomena. Mention will be made of them in a particular memoir.

On my return to Dresden, where head-quarters had been established, I was at first engaged with the organization of my staff and the location of the wounded. I commenced a course of practical and clinical surgery, to which the French and Saxon surgeons paid assiduous attention, and pursued the careful treatment of our sick. The commander-in-chief of the army being satisfied with the staff of our light *ambulances*, though in a very incomplete state, and being desirous of giving honourable stations to the military surgeons, ordered that a council, composed of the inspector-general, director, and surgeon-in-chief of the army, should examine, under the auspices of the minister, Count Daru, a project for a law relating to the organization of a corps of military surgeons.

During the armistice, the King of Saxony returned to his capital. He received on this occasion, from his subjects, the most touching testimonials of respect and attachment.

The French joined their acclamations to those of the inhabitants of Dresden, and from that period did not cease admiring the generous conduct of this virtuous Prince, whose solicitude for our wounded and sick was tender and constant, and by whose direction all the succour they required was prodigally bestowed on them by the civil officers of the hospitals. While exercising an active supervision in the hospitals, and continuing my lectures in clinical medicine, I endeavoured to organize anew our *ambulances*,

and classify the surgeons of the regiments. An account of the result of my operations during this astonishing campaign, was given to the two ministers in the army and at Paris, with whom it was my duty to correspond.

Fine weather having become established, and the temperature during the night being nearly the same as that prevalent in the day, the tetanic symptoms disappeared, and the gangrenous affections rapidly subsided. From this moment every wound progressed to a cure without any sensible obstacle.

Some individuals, accustomed to conceal the truth, with the view of diminishing in the eyes of Napoleon the considerable number of those who were wounded in the battles of Lutzen, Bautzen, and Wurchen, told him, that many of these individuals had been voluntarily mutilated, in order to incapacitate themselves for duty. In this class were included, all those whose fingers were mangled, and whose hands were traversed by balls. An order, based on these assertions, was given to collect all the wounded of this character, and confine them in the entrenched camp, a quarter of a league from the city, on the grand road to Bautzen. They amounted to nearly three thousand.

Being interrogated by the commander-in-chief of the army personally, as to the difference presented between wounds, resulting from a cause put in operation by the individual himself, and those, which are the effect of a foreign power, I gave it as my opinion, that no surgeon, *cæteris paribus*, could establish any dissimilarity whatever in reference to these two kinds of wounds. My ideas did not accord with those entertained by some of my colleagues. These notions did not prevail, and an order to form a surgical jury, over which I should preside, was immediately intimated to me. This court was charged with the duty of designating those whom it should find guilty of these offences, in order that they might be placed at the disposal of the general, grand-provost of the army. I will not transcribe here what was written me on this subject by this general officer; his letter contained the detail of the measures to be adopted for the government of the camp during our proceedings. Persuaded of the importance of the decision which I was called upon to make, in this

remarkable case of legal surgery, I persisted in the maintenance of my primitive opinion. The remaining members of the court participated in my notions, and, after having carefully examined all the wounded, we made the following report:

“In accordance with the order of the commander-in-chief of the army, and in virtue of the instructions of M. Count Daru, minister director of the army, expressed in his letter of June 13th, 1813.

“The surgical jury, composed of MM. Baron Larrey, inspector-general and surgeon-in-chief of the army and guard;

“Eve, principal-surgeon and knight of several orders;

“Charmes, surgeon-major and Knight of the Legion of Honour;

“Thebaut, surgeon-major of the hospitals; and,

“Becœur, surgeon-major of the *ambulances*, met on the sixteenth of the same month at five o’clock, A. M. at the appointed place, for the purpose of visiting two thousand three hundred and fifty soldiers, and two hundred and eighty-two brought from the *ambulances* of retreat, the total amount being two thousand six hundred and thirty-two soldiers of the whole army, who were wounded in the hands and fingers.

“This examination, uninterruptedly continued from the period of its commencement until the present time, the nineteenth of June, twelve o’clock, has been witnessed by a superior officer of the *état-major* and an officer of the king’s horse, sent by the grand-provost of the army.

“The inspection, made with the most scrupulous attention, had reference, first, to the character of the wounds, and the mutilations resulting from them;

“Second, To the causes producing these wounds, and the modus agendi of these causes;

“Third, To the circumstances which accompanied or preceded these solutions of continuity.

“And there result from this inquiry the following remarks:

“First, That nearly all the wounds were inflicted by contusing bodies, propelled by fire-arms, and that a few of them were caused by polished weapons, exerted against those who laboured under these injuries.

“Second, That the majority of the wounded presented at the same time other wounds in different parts of the surface of the body, or rents in their garments, more or less multiplied in number, made by the passage of balls.

“Third, That the small part of the wounded, in whom the foregoing circumstances did not obtain in so evident a manner, consists of veteran soldiers, whose fidelity it could scarcely be permitted to question.*

“The court in short declare, that there are no certain marks indicative of the difference, which may exist between two wounds from fire-arms, received at a very short distance from the instrument inflicting the injury, either voluntarily or involuntarily produced.

“The jury, in recapitulating, assert, that it is physically impossible to establish the least proof of any of the soldiers, visited by them, having voluntarily mutilated themselves. They are, moreover, of opinion, that the attentive examination of the circumstantial accounts,† which have been drawn up in writing, in reference to all the wounded subjected to this inspection, by explaining the causes of apparently so large a number of mutilations, will contribute to the dissipation of the unfavourable report propagated in relation to those who suffered these injuries.”

I presented this report to the emperor, and declared to

* Our examinations led us to believe, that the want of skill in the management of arms was the principal cause of these mutilations among the conscripts; that when they fired in three ranks, those in the second and third involuntarily rested the barrels of their guns on the hands of those in the first rank; that in managing their fire-arms, they were frequently wounded, as we have observed; and, in a word, the charges being made by the infantry in the battles of Bautzen and Wurchen on the back of the hills, and the soldiers having their hands constantly raised to their guns, that when they leveled them at the enemy, who occupied the summit of these hills, the balls of their adversaries would generally impinge on their hands, as the most projecting parts.

A similar reason caused a large number of fusileers of the guard, who uselessly attacked the enemy on the heights of Heilsberg, during the first campaign in Poland, to be wounded in the hands. These brave young soldiers were also accused of being voluntarily mutilated, through the assertion of physicians possessed of little knowledge. These circumstances occurred also frequently in Spain in mountain warfare.

† These details of the wounded were deposited with the minister, Count Daru.

him, that the charge preferred against these two thousand six hundred and thirty-two soldiers was entirely false, and that it appeared to me a matter of justice to restore all these individuals to their respective corps, in which they received a farther destination, according to the information we gave respecting their invalid condition.

The report was favourably received and my propositions adopted. A new order of the day was therefore established, by which the proceedings of the court were extended to all the wounded of the army, for the purpose of deciding upon their state of health.

I was charged with the duty of giving the necessary instructions to the principal surgeons of the different corps and surgeons-major of the hospitals, desiring them to make known to me, with as little delay as possible, the result of their operations. On this result, which I received at the end of July, was based my report to the commander-in-chief of the army, of the fourth of August of the same year, 1813.

It has appeared to me of sufficient importance to be embraced in my narration.

“In giving an account of the result of the campaign, which has just been concluded, so far as I am concerned, I have observed, that of the number of wounded, amounting to about twenty-two thousand, in the battles and engagements of the different corps of the grand army, comprising the guard, from the first of May, 1813, until the ensuing June, exclusive of the wounded belonging to the armies of the enemy, who were conveyed to our *ambulances*, fourteen thousand and eighty-four remaining in the hospitals situated between the Oder and the Rhine, have been examined by the courts of health, established in virtue of the order of the day for June 30th, 1813. Of these, six thousand seven hundred and three officers or cured soldiers have been restored to their respective corps, in order to resume their active duties; four thousand and twenty-seven in a state of relative sickness have been or will be employed in the train of artillery, equipages, or battalions of the *ambulances*; and in fine, three thousand three hundred and fifty-four, decided upon as being incapable of performing any

military duty, and in a state of absolute sickness, have been sent to France, with the exception of a small number, whose wounds had not sufficiently progressed towards a cure. Seven hundred and thirty-one of these three thousand three hundred and fifty-four have undergone amputation of one or two limbs; I performed amputation of the arm at the shoulder in twenty-two of these soldiers.

“I think, that of the seven thousand nine hundred and sixteen, who remained, and whose wounds had come to a termination before the general visit, decreed by the order of the day for the thirtieth of June, upwards of three thousand had already returned cured to their regiments, and about two thousand five hundred, who, I presume, were in a state of relative or absolute sickness, had arrived at this period in the cities of the Rhine, or passed into France, according to the report made to me by the surgeons-major of the hospitals.

“Two thousand four hundred and sixteen constitutes the total number of those who succumbed to their serious wounds. Of the dead, I compute the tenth part to have consisted of such individuals as had been subjected to amputation, and these being added to the seven hundred and thirty-one above mentioned, twenty of whom were deprived of two limbs, the total number of amputated amounts to nine hundred and seventy-two.

“This success, if the scarcity of resources, and the frequent variations of the atmosphere, which provoked tetanus, be considered, is essentially owing to the prompt and methodical succour received by the wounded on the field of battle, and to the vigilant and assiduous attention constantly bestowed on them by our surgeons in the hospitals.”

I had still the duty to perform, of proposing surgeons for the regiments, and classifying those who had been sent to the army by the prefects of the departments. This task was laborious and difficult. It would certainly have been more beneficial to form one, or several schools, nurseries as it were, of military surgery, in which the requisite number of young surgeons could have been educated. In their information, zeal, and energy, greater confidence could have been placed, and the inhabitants of the country still have kept

their own surgeons. We were also engaged in improving, provisionally, the active *ambulances* in the event of a new war. During the whole of this period, I continued my lessons in practical and clinical surgery, and pursued uninterrupted the treatment of all the sick under my charge, visiting personally one of the principal departments of the wounded. I had an opportunity, in these daily visits, of making important observations on some surgical diseases, of which we are about to speak.

Some reflections on wounds of the head, will form the commencement of this dissertation, and the lesions of the organs contained in the other cavities, etc. will afterwards be successively considered. The summary of our observations on some organic diseases of the extremities, and the results of our methods of operating having reference to them, will also be reported.

Reflections on Wounds of the Head, accompanied with fracture or shattering of the Bones of the Cranium, on Injuries of the same Part, complicated by the presence of foreign Bodies, and on the causes of Abscesses in the Liver, following some of these Lesions.

To avoid repeating what authors have written on wounds of the head, we will confine ourselves to pointing out :

First, Those cases in which trephining is indispensable, and the period at which this operation should be performed ;

Secondly, Those instances in which the trephine, though as strongly recommended by authors, is useless, even injurious, and the means that may be adopted, under some circumstances, as substitutes for this operation ;

Third, What is expedient in hernia of the brain ;

Fourth, and finally, the causes of abscesses in the liver, succeeding wounds of the head.

Proposition the First.

To point out the cases in which trephining is indispensable, and the time proper for the performance of this operation.

In a wound of the head, accompanied by a fracture of the cranium, should the fragments of bone be displaced and driven internally, so as to injure the brain and dura mater, the trephine is indispensable.

When the foreign body, which has caused the wound, is enclosed between the pieces of bone, or has penetrated into the interior of the cranium, without being removed from the vault of this cavity, the case is again one which demands the application of the trephine.

Finally, when the surgeon is assured of the existence of effused fluid under the cranium, this instrument is also indicated.

But previously to performing this operation, it is important to know, whether or not the symptoms, characteristic

of lesion or compression of the internal parts, actually exist. One of the principal symptoms of compression is paralysis, of greater or less extent, seated in parts on the side opposite to that on which the wound is situated. I have remarked, indeed, that when the parts of the brain or medullary productions directly emanating from it, as the processes of the medulla oblongata, or those of this part that are connected with its pyramidal eminences, are labouring under the lesion, paralysis is constantly developed on the side opposite the seat of injury. This circumstance explains, perhaps, why the tongue in hemiplegia is paralysed in that part of it, situated on the side of the body, other than the one which is the seat of the hemiplegia. For the ninth pair of nerves arise from the roots of the olivary bodies of the medulla oblongata, and these eminences are connected with the cerebellum, in which there is no crossing of fibres, so that paralysis takes place on the side of the lesion. These symptoms are recognized with so much the greater facility, as they are manifested immediately after the accident, and are developed in a gradual and progressive manner, unless the fracture be bounded at the anterior part by the frontal sinuses, and unless the foreign body be stopped in these cavities. In the latter case, which is distinguished without difficulty, these symptoms will be looked for in vain.

Thus, for example, should a ball of a small size, or a small piece of a ball, be arrested in these cavities, after having penetrated into them, the surgeon should not hesitate to lay open the whole extent of the fracture by suitable incisions,* and to apply a trephine of a diameter proportioned to the extent of the parietes of the sinus, so as not to exceed its limits. The foreign body, when laid bare, is easily extracted.

* Lesion of the branches of the frontal nerve should be avoided as much as possible in making the incisions, or if this be not possible, care should be taken to divide them completely. Even a slight injury of these nerves ordinarily gives rise to loss of sight in the eye of the same side, and sometimes causes tetanus. An example of this is found in our Campaigns; whereas the complete division of these nervous branches does not disturb the functions of those which contribute to vision.

The same indication is presented, when the foreign bodies are enclosed in one of the fossæ of the superior jaw, as the orbitary, nasal, zygomatic and maxillary sinuses. In this case, however, long and harsh examinations would be dangerous to the patient, since they would give rise to symptoms more serious than those which would result from the presence of a foreign body in one of these cavities. This rule is developed in the note, which accompanies several curious cases relative to this subject, in the third volume of my *Campaigns*.

Previously to demonstrating the uselessness and danger of the application of the trephine in wounds of the head, when this operation shall be indicated, we will report some facts having reference to our former assertion, viz. to the imperious necessity of extracting foreign bodies by some means, and giving issue to the fluids effused into the interior of the cranium.

After the battle of Witepsk, in 1812, I was called by one of our surgeons-major to examine two singular wounds, which occurred in the persons of two young Russian soldiers.

The first had received in the frontal region, somewhat above the right eye-brow, a ball, which having penetrated and fractured the os frontis between the superciliary arch and frontal boss of the right side, had passed into the interior of the cranium. This projectile was situated on the top of the anterior and right lobe of the brain, and the mammillary or orbitar boss and internal crista of the frontal bone.

Notwithstanding the large size of this ball, it appeared on the exterior to be very small, and the aperture, through which it was seen, was not more than from three to four lines in diameter. The trials and efforts made for its extraction had on this account been fruitless.

The patient experienced a sensation of weight and extremely painful dulness in the head, and fell into a state of syncope, when he assumed an inclination backwards. He kept himself constantly in a sitting posture, resting his head on his knees. All the symptoms of compression of the brain were, moreover, manifested. The jar communicated to a probe by the visible portion of the foreign body,

apprized us that it was an iron ball, the size of which must greatly exceed the diameter of the opening made by it in its passage. We also perceived that it was necessary, even urgent, to apply the trephine.*

The wound in the integuments being enlarged by two longitudinal incisions, the whole circumference of the aperture in the frontal bone was laid bare, particularly at its superior part, where we applied three small crowns of a trephine communicating with each other and with the perforation made by the ball. The osseous angles that were

* The difficulty of extracting the ball is generally presented in all cases, where a projectile has traversed the substance of bones, and particularly those of the cranium. (It is supposed to be arrested, as in this case, at the edge of the perforation it has made in its passage; for should the foreign body be buried in the interior of parts, particularly in the brain, no examination would be made.) This obstacle depends on the contraction of the aperture through which the foreign body has been transmitted. The osseous fibres, previously to being ruptured, yield and become curved under the weight and pressure of the instrument which produces the wound. But when the resistance is overcome, these fibres return to a straight line, and tend to approximate by converging towards each other, so that the foramen which results from the fracture and loss of substance in the osseous fibres, grows smaller in proportion to the elasticity and power of the tissues. This is what is observed in young individuals, as was seen in the case of the Russian, of whom mention has just been made. The bones, on the contrary, of old men are shattered, instead of bending or yielding, as in the former persons, to the force of the projectile, which does not overcome the resistance but by rupturing a portion of the bone equal, at most, to the half of its diameter. The small or large size of the osseous fragment will be in proportion to the spongy or compact state of the bone. The perforation of the latter, in the former condition, is effected without fracture. In all cases, if the extraction of the foreign body be desired, either when it is situated in the substance of the bone, or has passed through it, the surgeon is necessitated to employ the trephine, which, however, it is not requisite to apply but when it is evident that the presence of the foreign body menaces the life of the patient. Yet a favourable period should be selected for the performance of this operation.

In the contrary case, where the foreign body does not and cannot injure any organ of more or less importance to the life of the individual, it should be left to nature. She at length operates by necrosis, followed by exfoliation, or by the decomposition of a superficial bony circle, which retains and covers the foreign body. The latter, being gradually liberated and expelled from its situation by a subjacent vascular development, may be extracted by the least aid of art, and without any difficulty.

left being divided, the extraction of the iron ball, which weighed seven ounces, was easily effected by means of a strong pair of forceps and an elevator. (It has been deposited in the cabinet of the school of medicine at Paris.) A large quantity of coagulated blood, which had accumulated in this part of the cranium, was entirely removed by a wooden scoop. The pia mater, covering the corresponding lobe of the brain, was in a state of ecchymosis, and the encephalon itself presented a depression from about three to four lines in depth.

Having extracted several small fragments of bone, which resulted from the fracture of the upper wall of the frontal sinus, we placed on the wound a piece of fine linen dipped in warm sweet wine. The open space caused by the loss of substance, being filled with soft charpee, was covered with several compresses, and the whole of the dressings were kept in their situation by the bandage of Galen.

From this period the patient was relieved, and enjoyed a tranquil sleep of nearly two hours duration. Towards the evening, however, he became hot and febrile, and experienced acute pains in the head. He was bled copiously from the saphena vein, and the first dressing having been removed, a large emollient cataplasm was applied to the whole circumference of the wound. The patient was then placed on the use of diluent mucilaginous drinks, and anodyne and antispasmodic medicines. On visiting him the following day, I found his condition to be highly satisfactory, and unattended by any disturbance whatever in the sensitive functions. He, together with all the wounded in the same room, was put under the special charge of M. Rousselle,* a well instructed and zealous surgeon-major, who informed me some time subsequently, and during our stay at Moscow, that this patient, having entirely recovered, was removed with other prisoners to Poland. This cure is remarkable in many respects.

The second wounded Russian had been injured five days

* This estimable surgeon is numbered among those whom we lament.

previously in the left temple by a leaden bullet. One half of this projectile had penetrated into the cranium, becoming flattened by passing through a narrow fissure, which was caused by its impulse. The remaining half had inserted itself under the temporal muscle, as far as its posterior attachment, towards the base of the mastoid apophysis, at which point it had been arrested.

The patient was labouring under hemiplegia of the right side; he had lost the use of his senses, and was in a constant state of perturbation. The wound in the temple being laid open, and the point of fracture made bare, I discovered the course of the piece of lead, which had penetrated under the muscle, and extracted it through a counter-opening, made at the point where this foreign body projected.

A trephine was applied to the lower part of the wound, and very contiguously to the part where the other piece of lead had buried itself. I displaced it without difficulty, and extracted this foreign body, together with several splinters of bone, which were near it. Effused blood, to which I gave issue, was also contained between the cranium and dura mater.

The patient was at first relieved; but some days subsequent he fell into a state of asthenia, to which he succumbed. It is evident that this operation, (trephining,) if performed at an earlier period, would have saved his life.

A third individual, of the ex-guard, wounded in the battle of the Moskowa, entered the hospital of Cheremetow at Moscow. The injury, under which he was labouring, presented nearly the same symptoms as occurred in the case of the last mentioned patient. It was caused by a ball, which, after having fractured the middle and posterior part of the right parietal bone, had become enclosed between several bony fragments. These latter, propelled forwards by the projectile, had been forced by it under the cranium. The ball, which was supposed entire, came out through the same aperture. It was thought sufficient, simply to lay open the wound and apply ordinary dressings.

Symptoms of compression of the brain progressed slowly, and it was supposed that the patient would recover without an operation. But these symptoms became se-

vere, and placed his life in danger. The surgeon-major, M. Pierron, at this period directed that I should be sent for.

Relying constantly on the resources of nature, they rejected the operation of trephining, which we advised; the symptoms increased, and the individual died on the twenty-first day after the reception of the wound.

The examination of the cranium revealed the fourth part of a ball and a splinter driven into the dura mater, the part of the brain, at which they were observed, having ulcerated quite extensively. It is probable, that if these foreign bodies had been extracted at an early hour, the patient would have been saved.

We have seen analogous cases, in which the trephine was indicated. This operation, however, was not performed for fear of departing from the principles of the celebrated Desault, who considered it as fatal. Indeed, we repeat it, should the foreign bodies be situated at a distance from the internal face of the cranium, so as to penetrate into the brain, it is better to abandon the patient to temporizing measures than to make examinations in the interior of this organ, as we have seen done by some practitioners.

Proposition the Second.

To point out those cases in which trephining, though generally recommended by authors, is unavailing, indeed injurious, and the means to be adopted, under some circumstances, as substitutes for this operation.

The trephine should not be applied in wounds of the head, accompanied by fracture of the bones of the cranium, whatsoever may be the extent of this fracture and the number of its radii, if the fragments of bone be not driven inwards, no foreign bodies present, or symptoms of compression not very evident.

The brain suffers less from concussion in those instances of extensive wounds, with loss of substance in the soft parts, and fracture of the bones of the cranium, since the effects of the shock, caused by the wounding instrument, are expended on the external injured parts, particularly

when it acts in the diagonal direction of the vault of the cranium. In consequence of the internal parts in this case escaping lesion, the absorption of effused fluids is effected more speedily; the fragments of bone gradually approximate, and the disease may be cured by the efforts of nature alone. The trephine in such cases, without being at all beneficial, cannot but retard the cure of the patient.

Were we desirous of entering into the details of the disadvantages connected with the operation of trephining, as it is ordinarily performed, we would speak of the scraping of the bones as one of the most serious. This act, indeed, lacerates the membranes much beyond the spot where the trephine is to be applied. It provokes or augments the irritation of the neighbouring tissues, destroying the osseous fibres. Necrosis is thus brought on in all the denuded portion of bone, and sympathetic symptoms, more or less alarming according to circumstances, as for instance, abscesses of the liver, (these latter will form the subject of another article,) are produced. But we should here confine ourselves to repeating, that it is not necessary to apply the trephine, but when the necessity for it is well perceived; and this necessity is established only when fluids are effused into the interior of the cranium, and fragments of bone, or some other foreign bodies are injuring the brain or its membranes. The exposé of the following facts will, moreover, determine, better than the most enlightened theory, those cases in which the trephine is useless, and even injurious.

Case the first. On our way to Berlin, in May, 1812, M. ——, having under his charge the clothing of the army, was thrown down by a carriage which was passing very near him. His head struck first against the sharp edge of a large stone; the skin of the forehead, and all that covering the cranium, as far as the occipital protuberance, was detached, so that this very large flap hung over the neck and ears. The head was totally denuded, and in several parts was deprived of its periosteum. A fracture, in the form of a star, was presented on the left frontal boss, and one of its radii extended to the parietal bone of the same side. There was neither depression nor displacement of the bony fragments.

This patient had not lost his reason since the period of his fall, though he bled pretty profusely from the nose and ears; primary dressings were afterwards applied to the wound.

On the following day, this individual being very sick, was conveyed to the hospital of the officers at Charlottenburg, where we saw him for the first time on the same day. The pains being acute and constant, were accompanied by delirium, mental aberration, and nervous movements. The pulse was contracted, and the face inflamed.

Preparations had been made for the application of the trephine, which seemed to be indicated by the fracture to which we have alluded. This operation was suspended and we were engaged in dressing the wound. It became, in the first place, necessary to detach the flap, which had been applied to the cranium with too little care. Large masses of hair and charpee had been interposed between it and the head. Having shaved all the exterior surface, and removed all the foreign bodies, we made several incisions in the contused and inflamed parts of the pericranium, and through the flap, one of these being situated at its base, for the purpose of facilitating the escape of the fluids. One incision corresponded to the fracture. The wound was washed with warm sweet wine, and the soft parts re-applied and maintained in their natural relations with the contiguous parts, by means of adhesive straps and a piece of fine linen dipped in the same liquid. The dressing of the wound was terminated by the application of charpee, compresses, and the bandage of Galen. The patient was bled from the foot, and cooling drinks, glisters, and pediluvia prescribed.

The evacuation caused by the incisions in the flap and neighbouring injured parts, in conjunction with the means of which we have just spoken, removed the pains and delirium. The patient became tranquil, and continued in this state until night. But then, symptoms of inflammation were again developed and progressively augmented. Bleeding from the jugular vein, and mucilaginous, sedative, and antispasmodic drinks allayed them, and the patient was relieved. The remaining part of the night was calmly spent; but the two following days were again attended with dis-

turbance. The intensity of these symptoms, however, diminished, and a sero-purulent secretion was manifested on the third day; the first dressings were removed on the fourth day. The flap had become adherent in many points, and suppuration began to be established in its whole circumference. A piece of linen was applied again, having on it the unguent of storax, with the view of facilitating the detachment of the sloughs, which were observed on the edges of the flap. The same treatment was continued.

Pus was secreted in large quantities, the strength of the patient was diminished, and he was attacked by a febrile asthenic affection, which began with rigours, colicky pains, nausea, and extreme anxiety. A burning fever succeeded the cold stage, and was accompanied by thirst and pain in the head. We were called during this paroxysm, and prescribed mucilaginous drinks, acidulated and containing ice. The whole surface of the body was bathed with cold camphorated vinegar, and the camphorated unguent of storax was continued in the dressings of the wound.

These alarming symptoms were gradually allayed, and the intermission was announced by perfect tranquillity, and a general cessation of these phenomena. Spontaneous vomiting of bile and an involuntary evacuation occurred. This favourable moment was seized upon for the administration of an emetic, consisting of a scruple and a half of a strong and cold infusion of ipecacuanha and a grain of tartar emetic. This medicine was followed, without exertion, by copious emesis, and abundant and very foetid alvine evacuations.

On the following night, a very violent paroxysm with delirium, and a pain fixed in the occiput towards the base of the flap, ensued. This pain was seated in that part of the head which had suffered most from laceration. The application of two cups, with scarifications, to the part, removed it, as if by a charm. The scarifications and the whole of the occipital region were covered with a double compress, dipped in camphorated wine containing ice. On visiting the patient the following day, all the symptoms of pyrexia had entirely disappeared. But his vital powers were very much debilitated, and every thing induced me to fear the approach of a pernicious fever. As there still

existed tension in the back of the neck and pain on moving the head, we caused a large blister to be applied to the part, and prescribed bark in substance in an infusion of arnica and Virginia serpentaria, with the addition of sulphuric ether. The bark was given in drachm doses, repeated every hour, and some small glasses of Hungarian wine were administered during the interval. The paroxysm in the night was slight, and on the succeeding day, which was the nineteenth of his fall, the patient, who until then had continued in a state of stupor, resumed power over his senses. With the exception of some parts of the frontal bone, which appeared to be necrosed, the remainder of the wound, which was red and covered with large granulations, was disposed to cicatrize.

Being obliged to follow the movements of head-quarters, which took up their march on the twenty-first of May, we put this patient, already liberated from danger, under the charge of M. Billequin, one of our surgeons of the first class, who had under his direction the hospitals established in Berlin. This surgeon-major subsequently informed us, that after our departure the patient continued to improve; that several small fragments of bone were exfoliated, and that the removal of one of these, comprising the two tables of the bone, left a part of the dura mater exposed. The wound gradually cicatrized, and M. —— left the hospital perfectly cured, the ninetieth day after entering it.

We have seen this officer since our return from Russia; he was enjoying perfect health. A cicatrix of half a finger's breadth extended in a circular direction from the frontal bosses to the temples, terminating on each side about an inch from the occipital protuberance, at the point where the flap terminated. He continued bald, and had almost totally lost the recollection of proper names. All the other mental faculties were sound, and appeared to be correctly exercised.

This singular fact and cure are worthy of remark. Should the trephine have been applied in conformity with the opinion of authors and many surgeons who saw the patient, there is every reason to believe that he would not have survived the operation. Indeed, had the dura mater, which was doubtless inflamed by the third day after the acci-

dent, been laid bare, and irritated by the trephine, it is probable that a gangrenous affection would have supervened. In cases of such a nature, this is the principal cause that counterindicates the operation. In those instances which demand its performance, and which we have pointed out, it should at least be deferred, should symptoms of inflammation exist in the cerebral membranes.

Case 2nd. M. Giraud, chief of battalion of the ex-guard, directing the works in the explosion of a mine, was struck on the head by a large piece of rock as it was descending. One of its sharp angles divided the integuments of the superior and posterior part of the cranium, and caused a fracture, with several radii, at the posterior angle of the left parietal, and the superior of the occipital bones. The middle fragments were denuded of their periosteum, and the wound in the integuments was about two inches and a half in extent.

The patient did not fall on receiving the blow, and was not deprived of his reason. Local pains only were experienced by him. His mental faculties were not affected, and no symptom of compression of the brain was manifested, nor was there paralysis of the opposite limbs. A slight traumatic fever supervened the third day after the accident. The attending surgeon in the mean time had resolved upon the application of the trephine, as the only means from which any advantage could be expected. Dr. Ribes and myself were consulted. Besides the symptoms of which we have spoken, the wound was found to occupy the whole posterior part of the head, with four irregular flaps, which had just been formed. A large part of the cranium had been laid bare, and a portion of it scraped. As no serious symptoms presented themselves, we judged it necessary to defer the operation, and proposed even to approximate the four flaps; and having washed and cleansed the wound, to cover it with fine linen, dipped in warm wine. The dressing was completed by the application of charpee, compresses, and the bandage of Galien. The patient was placed on the use of sweetened lemonade and antispasmodic potions.

The pains subsided, the irritation was gradually allayed, and the condition of the patient so much improved, that

the operation of trephining was abandoned. The dressings of the wound were renewed at suitable periods, and the same regimen continued.

A few days subsequently, the army commenced its retreat to France. I lost all knowledge of this superior officer, and supposed him to be dead; but, in the vicinity of Kowno, I found him during the night, lying in the house of an inhabitant of a village near this city, where I found shelter. His wound was progressing rapidly towards cicatrization, and several small pieces of the bones of the cranium had been already exfoliated. This brave officer, who had the boldness to follow on foot the laborious marches of the army, had almost completely recovered on reaching ancient Prussia; here we again had an opportunity of seeing him, and dressing his wound. The cicatrix was large, adherent in nearly the whole of its extent, and presented in its centre a pretty considerable loss of substance.

The sensitive and mental functions had experienced no alteration, and this commander enjoyed perfect health.

A third case of this kind will be reported in the article on abscesses of the liver, following wounds of the head.

These facts prove, that the operation of trephining is rarely indicated, and that it should not be performed but with the utmost circumspection in reference to the stage of the wound which requires it.

We have pointed out those cases, in which we recommend this operation; it now remains for us to determine, at what stage of the wound it may prove salutary, and at what period dangerous.

If a surgeon be called to a wounded individual during the first hours after the accident, he should take advantage of this moment to perform the operation, and thus extract the foreign bodies which are effecting a lesion of the dura mater or brain. Inflammation is generally established in the meninges after the first twenty-four hours succeeding the occurrence of the injury. Should it already be developed, the trephine could not be applied without causing new irritation, which would be augmented in proportion to the extensive removal of the pericranium, and the increased number of perforations of the instrument. Finally, the

moisture, or unhealthy state of the atmosphere, may also aggravate the effects of inflammation. The portions of the membranes that are laid bare, being inflamed, are quickly altered, and it rarely happens that they do not soon become gangrenous. We have seen several cases to this effect, and such is doubtless the cause which led Desault to the abandonment of this operation. In the latter case, the trephine should not be applied, until the inflammatory symptoms are dissipated. The presence of the foreign body, whence result the effects of compression of the brain, is less dangerous than the attempts made during the existence of inflammation to displace or extract it. The death of the patient will ensue even more speedily than if he were abandoned to the resources of nature alone; for his dissolution is inevitable, when inflammation and suppuration are deeply established in the membranes of the brain and its proper substance.

We will repeat then, that it is necessary to apply the trephine, when it is strongly indicated, previously to the developement of inflammatory symptoms, which are manifested more or less speedily, according to the idiosyncrasy and age of the patient, and the nature of the cause producing the wound; and that when these symptoms appear, the operation should be delayed until their subsidence. Should this second stage not present itself, it is preferable to abandon the individual to his certain doom, than to attempt the execution of a remedial plan which is unavailing, and cannot but hasten his latter moments.

The operation having been performed, a piece of fine linen, dipped in wine containing honey or sugar, together with soft charpee and a simple retentive bandage, should be placed in the perforation formed by the trephine, and over the whole wound. The balsam of Fioraventi and other re-percussive irritating fluids should be rejected from surgical practice. The dressings, consisting of simple means, should be applied tightly, and with the necessary precautions, so as to defend the wound from the external cold and humid atmosphere.

The mucous and cutaneous secretions should be promoted, in order to divert the irritation and congestion from

the injury, or organs susceptible of sympathetic derangement. Cups with scarifications and diluent acidulated drinks perfectly fulfil this indication.

Proposition the Third.

To point out what is expedient to be done in hernia of the brain.

Before entering upon this proposition, an important question, and one difficult of solution, naturally presents itself; viz. to determine what causes hernia of the brain, through an aperture made in the cranium, either by some wounding instrument, or by the trephine. Without pretending to solve perfectly this problem, I will attempt an answer, which may lead to the truth.

We have been enabled to observe in many individuals, that the irritation which is concentrated in the part of the brain corresponding to the opening in the cranium, may depend as well on the contact of the external air, as on the presence of foreign bodies.

The encephalon, traversed in all directions by innunerable arterial branches, must undergo a spontaneous expansion, the effects of which become so much the more sensible, as the walls of the cranium do not offer an equal resistance at all parts of its cavity. Thus, when a portion of these osseous parietes is suddenly removed, the corresponding part of the brain becomes exuberant, and a mechanical irritation exercised from the exterior towards the interior, this expansion is increased, and hernia immediately produced. The displacement of this exuberance gradually augments, and a tumour of greater or less size is formed on the exterior, exhibiting vital phenomena that are not observed in the healthy state. Pressure, exerted on these cerebral productions, gives rise to a feeling of pain in the whole circumference of the wound, and if it be continued, the patient experiences nausea, and is subjected to pandiculations; the sensitive functions are disturbed, and syncope supervenes.

Should this tumour be cut off, the same part immediately furnishes a new exuberance, which, if removed, has another formed in its stead. These excisions, moreover,

cannot be made, without bringing on very serious symptoms, followed by death. We saw one example of this in the army in Saxony, during the year 1813.

In our visit to the hospital of the arsenal at Dresden, we saw one of our wounded, who had just been dressed, die in horrible convulsions of a few minutes duration. We were informed that the surgeon, conformably to the advice of authors, had thought it necessary to cut off a pretty large part of the brain, which protruded through an opening of about half an inch in diameter, resulting from the extraction of a splinter of bone. During the operation there had occurred only a slight syncope, preceded by a desire to vomit and to yawn. The removal of the dressings indeed disclosed to us the excision of the part of the brain, external to the above mentioned aperture.

Authors have recommended the exercise of pressure on these tumours, and some have proposed for this purpose plates of lead. This method may cause the developement of serious symptoms, similar to the effects produced by the use of alcoholic and astringent liquids, since they all aggravate the irritation, and disturb the vital powers of that portion of the brain with which they are in contact.

What then ought the surgeon to do in a case of encephalocele, formed through an accidental deficiency in the bones of the cranium?

It should be observed, that a large hernia of the brain is one of the most grievous accidents which accompany wounds of the head, and that individuals, labouring under it, rarely recover. The developement of these herniae presupposes an extreme exaltation of the irritability of the pia mater and cerebral vessels, and an extensive alteration in the encephalon itself. It is difficult, if not impossible, to remedy it, and the means recommended for repressing these growths, instead of being favourable to their return into the cavity of the cranium, only develope the causes of these exuberances. All the wounded, in whose cases these remedies were employed, have been observed by us to perish; but one (the hernia however was not large) escaped the symptoms we have described!*

* The simple means alone, of which we are going to speak, were employed; the tumour gradually subsided, and the patient recovered.

The applications to the protruding portion of the brain should be confined to a piece of fine linen, dipped in the oil of chamomile, containing a small quantity of camphor. The causes of the interior excitement and external mechanical irritation should be considered, and this increased action reduced by cooling drinks. All foreign bodies, giving rise to it, should be removed with the requisite precautions, and to as great a degree as possible. The injured parts should be defended from the external air, and, finally, the dressing executed with great mildness. No pressure ought to be exercised by the dressings on the sensible parts.

When the encephalocele is capable of being reduced, nature, thus aided, gradually carries on her work, and the entire protruding portion of the brain returns into the interior of the cranium, like the omentum which has escaped through a wound in the abdomen.*

While speaking of serious wounds of the brain, we will report, in this place, the summary of two cases of injuries of the head accompanied with lesion of this organ. Although they have no reference to that on which we have just been discoursing, they have appeared to us of too interesting a character to be excluded from this chapter.

During the campaign of Moscow, Barbin, foot-grenadier of the ex-guard, was wounded by the lance of a Cossack in the posterior part of the head, near the point corresponding to the union of the posterior and superior angle of the left parietal to the occipital bone. The iron point of the lance was so well tempered, that it penetrated through the bone without causing it to be shattered, passed into the cranium, injured the posterior and left lobe of the brain, and buried itself deeply in its substance. The subject of this wound was left on the field of battle, supposed to be dead. He was, however, removed some hours subsequently, and conveyed to the neighbouring city; his sensitive faculties were for a long time suspended.

* Though there is not a perfect resemblance between these two affections, we will endeavour to explain, by analogy, the mechanism of the reduction of the omentum, in the article on this subject.

The wound was dressed, and passed through its stages, until cured, without any remarkable occurrence. The cicatrix continued sunken, and there existed at the corresponding point of the bone a loss of substance an inch and a half, or about this, in length, and half an inch in depth. The individual does not at present experience any pain in this part, and his intellectual faculties do not appear to be deranged. But it is evident, that this wound has affected the functions of the nerves of the medulla oblongata or vertebralis, as the glosso-pharyngeal, par vagum, hypoglossal, spinal, and sub-occipital.

In the first place, the voice, after having been hoarse and low, has gradually disappeared, so that Barbin has fallen into a state of complete asphonia. Deglutition is performed with difficulty; taste and smell are diminished; the extrinsic and intrinsic muscles of the larynx are partly paralysed, so that this organ is removed about half an inch from its natural position. The edges of the glottis are drawn together by this unnatural falling of the part, and the epiglottis is bent over this aperture, by the dragging force exercised on the aryteno-epiglottideal muscles. Thus, to respire, the patient standing up, is obliged to close his jaws tightly at every instant, for the purpose of raising the larynx by a simultaneous contraction of its elevator muscles, and those of the pharynx and maxillæ, as is the case with frogs, in order to inhale the air necessary to their respiration.

The diaphragm of Barbin, participating in the paralysis, cannot act on the lungs. Frogs that are destitute of this muscular partition, supply its absence, as Heroldt* has observed, by closing their jaws, and it is probable, according to the experiments made before the Philomathic Society on this individual, that had his jaws continued separated for some seconds longer, he would have been suffocated, as are these animals, when they are subjected to the same experiment for some moments.

The pharynx, œsophagus, and stomach, participate also in the paralysis, for deglutition is performed with difficulty,

* Nouveau Dict. d'Hist. Nat. tom. X. art. *Grenouille*.

and tartar emetic, administered in large or small doses, has no effect on the stomach. Since the occurrence of the accident, no emetic operation whatever has been produced on this grenadier.

The abdomen scarcely moves alternately and isochronously with the respiratory motions, as is observed in all persons. When the patient is subjected to the slightest experiments which we perform on him, his face becomes discoloured, his body covered with sweat, the cold habitually experienced by him in his extremities augments, the action of the heart is very tardy, and scarcely sensible, and the pulse almost absent. Barbin breathes better, and is more comfortable, in a horizontal position. His digestion is slow and painful, and he is obliged to eat often, and a little at a time, having recourse only to the lightest aliment. He is very much emaciated, and threatened with marasmus.

Such, in general, are the phenomena which arose from this remarkable wound.

Case 2nd. M. Derampan (Edward) an ex-officer of cavalry, about twenty-six years of age, having made the campaign in Russia, and received during it several slight wounds, was struck while fencing by a foil, (the point of which was broken against his plastron) March second, 1817, in the middle part of the left canine region, near the ala of the nose, in an oblique direction from below upwards, and somewhat from the exterior to the interior. The instrument penetrated to the depth of three inches and a half through the left nasal fossa, and doubtless passed through the cribriform plate of the ethmoid bone, near the insertion of the falx major of the dura mater. It seemed to have been thrust in a vertical and somewhat oblique direction, from before backwards, to the extent of eight or nine lines, into the internal posterior part of the left anterior lobe of the brain, so as to approach the front part of the corpus callosum.

Very violent hæmorrhage occurred on the infliction of the wound, and a considerable sanguineous effusion into the interior of the cranium probably took place. A short time afterwards, the subject of the injury fell into a state of syncope, and from that moment totally lost the use

his senses ; the activity of which has been restored, however, in a manner gradual, imperfect, and attended with remarkable peculiarities. Vision returned in a few days in the right eye, whereas the left one was totally deprived of it for more than a month. By degrees, however, it has been entirely restored to both, but the patient even now sees objects double. The sense of smell having been there totally extinct, now exists on the right side, and the individual readily distinguishes, by this portion of the organ, the odour of alcoholic liquors from inodorous liquids. This sense, however, is still less active than on the left side.

The patient also lost his taste, but in such a manner that the right half of the tongue possesses this power in a very considerable degree, while its left side is destitute of it. The whole of this organ is drawn to the right in opposition to the hemiplegia which exists on this side, and the commissure of the lips is carried to the left part of the body. Hearing, which was at first destroyed in the ear of the side where the wound existed, was subsequently restored to it. The voice, which was also lost, has gradually returned, and there merely remains a slight degree of stammering.

The organs of generation have undergone no change.

The whole of the right side became completely paralysed. At present sensibility exists; motion, however, is still restrained, but improvement is plainly evidenced.

The recollection of substantive nouns, which bore much analogy to proper names, was totally destroyed, and is not at present regained but with very great difficulty ; whereas the memory of images, and every thing susceptible of description, is in a state of perfect integrity. Thus, for instance, the patient recalled very readily the person and features of M. Larrey, whose services he had frequently received in different diseases and wounds. He knew him very well, and saw him constantly before his eyes, (expressions used by the patient,) but he could never recollect his name, so that he designated him by that of M. Chose. He also forgot the names of his relations and friends,* and

* The same fact was observed in the case of M. de Broussonnet, professor at Montpellier, some time before his death, as well as in the persons of several other individuals. (See the eulogy of Cuvier.)

was entirely incapable of remembering those of the various pieces which enter into the composition of a gun-carriage, although he could very well describe them.

The mental aberration to which this officer was subject, in the first instance, has ceased ; but every thing relating to his self-love, military successes, &c. still causes an alienation of mind, (this may be called *δοξομανία*,) and gives rise to profound melancholy; while in conversations that refer to his family connexions and friends, he is perfect master of his intellectual powers.

Proposition the Fourth.

To inquire into the causes of abscesses of the liver, following wounds of the head.

Many hypotheses have been successively formed for the explanation of the causes of abscesses in the liver, consequent on injuries of the head and the sympathetic relations, which have been supposed to exist between the brain and hepatic viscus. These have been more or less accredited, according to the celebrity of their authors, or the period at which they lived. I shall not attempt to combat those which have already been discussed by the academy of surgery and by authors. I shall only make some reflections on the new doctrine, which appears to be most generally adopted at the present day.

The celebrated author with whom it originated, refers the causes of abscesses in this organ to the direct or indirect blow, received by the liver, at the time that the wounds of the head are produced by the wounding instrument. To support this assertion, the author says, " that those injuries arising from the immediate blow on the head, in which the concussion is confined to the brain, and does not extend to the other viscera, are not complicated with abscess of the liver, an evident proof that the connexion existing between those affections must be attributed to the shock communicated simultaneously to the liver and brain." (*Nosographie Chirurgicale*, 4th edition, 1815.)

This explanation is accompanied with several cases, and experiments made on forty dead bodies.

We shall confine ourselves to the following remarks: 1st, All the cases do not appear to have an exact relation with the lesions of the head, at least, in the true sense of the question. Indeed, the subjects of the first two which the author reports, died during the twelve hours immediately succeeding the accident. In their severe fall from a very elevated situation, the impetus of their bodies being directed against the right hypochondrium, the hepatic viscous, a dense and friable organ, was subjected to such violence, that it must necessarily have been ruptured and lacerated to a greater or less extent, while the integuments of the thorax and abdomen remained uninjured. This state of things resembles that produced by a spent ball in the soft and rounded parts, with which it comes in contact. The wheel of a carriage, passing over the same portion of the body, would produce a similar effect. But these disorders of the liver may occur in case of an individual's falling without there being the least alteration in the cranium or brain. We have frequently observed this fact, and the lesion, either of the hepatic organ or encephalon, though arising from analogous causes, may exist very well in a separate state. Here we have an example to this effect. On the thirteenth of February, 1817, a domestic was conveyed to the military hospital of Gros-Caillou, in consequence of a severe fall from his horse, in the trenches of the Champ-de-Mars. The weight of the body was exerted principally against the right hypochondrium, and the individual died a few hours after his entrance into the hospital. On examining the body the following day, we found the integuments of its whole surface uninjured, the abdomen swollen, the right hypochondrium much more elevated than the left, and an effusion of about two pounds of dark bilious blood in the abdominal cavity. All the viscera in the latter were inflamed, and two fissures were observed in the concave face of the liver, the whole body of which was reduced in size. The tissue of the corresponding ribs was softened, and was destroyed by the least effort. The intercostal muscles and right side of the diaphragm were in a state of ecchymosis. It is evident, that the almost sudden death which took place, should be attributed to laceration

of the liver; this almost always proving fatal, if it communicates with the abdominal cavity.

2nd. The experiments made on dead bodies do not appear to throw greater light on this question, which we will attempt to solve at another time. Can the causes of the phenomena, observed in bodies destitute of vital action, be applied to those in the living state? What must be thought of the concurrence of the circumstances, which affect a change, simultaneously, in the liver and brain, when, in cases of severe falls, followed more or less speedily by the death of the individuals, we have frequently found, on inspecting their bodies, the cranium and limbs fractured, and the liver still in a sound condition?

Let us, for a moment, interrupt the succession of objections suggested to us by the above mentioned hypothesis, and report succinctly three cases, which will prove, (contrary to the opinion entertained by the advocates of the mechanical causes of abscesses in the liver,) the extreme difficulty with which this organ is disorganized by falls or blows, particularly when the weight of the body does not act directly and violently on this viscus. This circumstance, again, is very uncommon, for I have met with it only on one occasion.

A young horseman of the ex-guard, in a paroxysm of delirium, threw himself from the window, in the second story of one of the halls for fever patients, in the hospital of Gros-Caillou, and fell on the pavement of the court. He expired some hours after being conveyed to the rooms appropriated to the wounded. The extreme debility, occasioned by the haemorrhage from his nose and ears, and the concussion of the brain, did not permit the performance of any operation. We saw the patient previously to his death, which was preceded by convulsive movements.

His body was carefully examined, with the view of discovering the disorder, which we supposed to be seated in the liver. There were observed; first, a well marked separation between the parietal bones respectively, and between these and the frontal bone; and, second, in the occipital, which had undergone no displacement, a splintered fracture, the radii of which extended in a diverging man-

ner towards the base of the cranium, and as far as the occipital foramen. The dura mater was detached in several points from the vault of the cranium, the brain sunken and congested with blood. The ventricles contained a large quantity of this fluid. Third, the right arm was luxated, and the elbow of the same side fractured. The left thigh, and sixth and seventh vertebrae were broken.

On opening the abdomen, we were astonished at finding the liver and other viscera in a sound condition; the intestines were merely distended by gas.

Blood in a small quantity was extravasated into the right cavity of the thorax, arising from the rupture of the vena azygos. The lungs and heart presented nothing remarkable.

Case 2nd. Pierre Gérard, master-cook in the hospital of Gros-Caillou, returned home intoxicated during the night between the fourth and fifth of September, 1815. Being very warm, he seated himself on the edge of the window, in his chamber in the second story, with his back turned towards the court. He fell asleep in this position, involuntarily inclined backwards, turned over, and was precipitated to the ground. On hearing the noise occasioned by his fall, they ran, and found him lying perfectly motionless and almost destitute of life.

The two inferior limbs were shattered, and the right one, particularly, entirely disorganized. A superficial contused wound was also observed on the right temple, unattended with fracture of the cranium, and several violent contusions were seen on different parts of the body. We learned, on visiting him the following day, that he had experienced symptoms of concussion, and that there had been considerable hemorrhage from the anterior tibial artery, which, as was the case with the soft parts of the right leg, was lacerated by the separation and disorder of the bony fragments. Notwithstanding the extreme debility of the patient, we thought that the first indications could and should be fulfilled. Of these, the most urgent was the amputation of the disorganized leg. This operation was performed at a point very contiguous to the knee, through the head of the tibia. The condition of the other limb, though the fracture was comminuted, being such as to inspire

us with hopes of saving it, we placed it in an apparatus appropriate to this injury. Embrocations with warm camphorated brandy were made over the whole surface of the body, and a proper regimen prescribed.

The first three or four days were attended with much disturbance; but the seventh day having elapsed, a calm succeeded the alarming symptoms, which, resisting until that period the remedies we employed, had deprived us of all hope of saving the patient's life. Suppuration was established in the stump, and became abundant, and in a few days the wound assumed a healthy condition. A traumatic fever, which might be looked upon as favourable, was developed, the individual continued to improve, and appeared with the most favourable symptoms, when he unexpectedly died during the night of the seventeenth of September, after having conversed a long time with the keeper of the hall. This individual incessantly experienced pains in the epigastrium, accompanied with oppression and debility. Blisters and cups with scarifications were applied to this part.

In the examination of the body the succeeding day, we found the abdomen tense and flatulent; the stomach and intestines were discoloured and distended with gas, and the mucous coat of the former presented, in some parts of its surface, marks of phlogosis. The liver and other viscera of the abdomen were in their natural state, and nothing of a particular character was observed in the lungs. The ventricles of the heart contained yellow albuminous concretions, and were devoid of blood. The arteries were filled with gas, and the very small quantity of blood in the veins was black and coagulated.

The vessels of the brain were slightly congested, and, at a point corresponding to the contusion on the temple, an ecchymosis of moderate degree, occupying a large part of the middle lobe of the right hemisphere, was perceived on this organ. The causes of death in this case may be referred essentially to the concussion of the brain, the almost sudden atony of the intestines, the sinking of the nervous system, and the hemorrhage which occurred immediately after the fall of the patient.

Case 3rd. This case, I think, will confirm the principles

which we have laid down, that hepatic abscesses, the subject of our present remarks, do not result from mechanical causes.

Frédéric Habrer, baggage-soldier of the fourth regiment of cuirassiers belonging to the royal guard, aged thirty-four years, of a strong constitution, standing on a cart loaded with hay, for the purpose of tightening the rope employed for pressing down and confining the latter, was thrown upwards by the sudden slipping of the cord, which was unhooked from the capstan, the transverse piece of the latter having escaped from the hands of his assistant. Being thrown some feet above the hay, he was dashed against the pavement of the street, where he continued for some moments without evincing any symptoms whatever of life. He lay on his right side amidst the blood, urine, and faecal matter, arising respectively from the hemorrhage from his nose and ears, and the sudden and involuntary discharge of the urine and alvine contents. He was, however, taken up, and conveyed to the hospital of Gros-Caillou at seven o'clock in the morning, the hour of my visit ; it was the fifth of October, 1816.

He was pale and discoloured, and was labouring under stupor, depression, and general paralysis. The whole of the right side of the face was ecchymosed, and the cheek very much tumefied. The nose was crushed, and a transverse wound was observed above the right eye-brow, accompanied with a radiated fracture of the frontal bone, very great swelling of the eye-lids, and total closure of the eye. The shoulder, arm, elbow, back, and particularly the buttock of the same side, were covered with ecchymoses and excoriations.

There existed, for a short time, mental aberration and tremor in all the limbs. The patient had scarcely any pulse, and could not answer the questions that were proposed to him ; in short, I saw his condition to be one of the greatest peril. In the first instance, heat was applied, and the whole of his head shaved and covered with compresses dipped in very warm camphorated vinegar. I prescribed a mustard plaster to the feet, and an antispasmodic potion at night. These symptoms of concussion were soon succeeded by those of inflammation in the injured parts and

the membranes of the brain, (the second day after the accident.) I made deep incisions into the wound and laid bare the point of fracture. The external wall of the frontal sinus was divided into fragments resembling stars, and one of the radii extended some lines above this part. The branches of the frontal nerve, lacerated by the wounding instrument, were comprised in my incisions, and no unfavourable symptom occurred in consequence of it. But I guarded against scraping the bone for the purpose of removing the pericranium, (as authors advise,) seeing previously that the trephine would not be necessary, since there were no depressed fragments of bone. It was requisite to apply a ligature to the frontal artery. A piece of fine linen was placed over the wound, with the precaution to approximate its angles. Soft charpee, compresses, and the bandage of Galien, terminated the dressings. The patient was placed on the use of cold diluent drinks, accompanied with the administration of purgative glysters and embrocations, with camphorated brandy on the parts labouring under ecchymosis. These primary means allayed the inflammatory symptoms, and the nervous spasm in which the patient was found. In consequence, however, of the acute pains experienced in his head, he was bled pretty largely from the jugular vein, and his legs placed in a warm mustard bath. Several cups with scarifications were applied to the neck and epigastrium, and leeches to the right cheek, which was still very much tumefied. The inflammatory symptoms having, in the first instance, been dissipated, returned towards the fifth day with renewed intensity, and particularly those seated in the head. Cups, with scarifications, were again employed around the neck, and the saphena vein opened. We continued the same drinks with ice, and had recourse to cold emollient cataplasms to the head. The antispasmodic potion was still taken by the patient at night.

A state of calm finally supervened, and the individual, who, until that period, (the eighth day,) had remained in a stupor, and had been deprived of his sensitive functions, became repossessed of his senses, and asked for every thing he required. Chamomile tea was substituted for the diluent drinks, and I prescribed a theriacal vinous

potion at night, and broth, with a small quantity of wine. Suppuration was established in the wound, and pus was copiously secreted. Several small abscesses, which formed successively in the lids of the right eye, and at the root of the nose, were opened. On the thirteenth day, the patient being in the most promising condition, symptoms of asthenia, attended by stupor and well marked gastric disorder, were suddenly developed. The secretion of pus was not diminished, but the colour of the matter was greyish, and the wound presented a bad aspect. An emetic, composed of 25 grs. of ipecacuanha, and 1 gr. of tartar emetic, was administered to the patient without delay. This medicine produced copious evacuations, both upwards and downwards, which were followed by abundant perspiration and a perfect calm. The patient was still habitually somnolent, and constantly complained of pains in his head. As no symptom of paralysis in the limbs nor effusion under the cranium existed, I refused applying the trephine, though several physicians, who saw the individual, thought it to be indicated. The part of the head corresponding to the wound, by my direction, was covered with a large blister; and I prescribed for the following day, (the sixteenth after the accident,) the calisaya bark in decoction. The broths, strong wine, and aromatic embrocations were continued. All the alarming symptoms were speedily dissipated, the patient progressively improved, and his sensitive and organic functions were gradually re-established. Several small fragments of the proper bones of the nose, and external wall of the frontal sinus were exfoliated; the wounds cicatrized pretty promptly, the vision of the right eye was not changed, and this soldier was found in such a condition, as to be able to leave the hospital the first of December of the same year. This fact also proves, that the trephine is only necessary in those cases we have indicated.

Should the liver, as has been asserted, in consequence of a fall of moderate violence, be susceptible of laceration or alteration, so as to produce inflammation or large abscesses in its parenchyma, the subjects of the foregoing cases must have presented these changes in their greatest degree. But we frequently met with them, following slight wounds of the head without fracture, the individuals having had no

fall, nor been subjected to a concussion of sufficient violence to impart a shock to the hepatic viscus.

The weight, organization of this gland, and the situation it occupies in the abdomen, have been artfully cited to support the hypothesis of the changes, which have been so gratuitously supposed to take place in it. Nature, in this respect, has been accused of negligence. But in relation to this organ, as to all of the living system, she has, on the contrary, regulated so well her designs, and taken so many precautions, that, except by a direct and truly destructive action upon it, the liver is not more liable than any other organ to be detached, ruptured, or altered in consequence of a fall, or any other indirect mode of exerting force upon it. Whatever, moreover, may be the state of the stomach, the individual will never lose his equilibrium, and this assertion could be proved without difficulty, did not daily experience exempt us from such an undertaking. I have made some similar remarks on the subject of spontaneous rupture of the arteries, to which it has been pretended to refer the essential cause of aneurisms, even of those that are internal.

But it is time we should enter upon the question, of which we are going to attempt a solution, viz. to determine the causes of the formation of abscesses in the liver, following wounds of the head.

Some modern authors, and particularly Desault, have had a presentiment of these causes, without having developed them.

We have, for a long period, had occasion to observe, that the functions of the pulmonary and bilious organs, especially the latter, are disturbed, and signally influenced by the phlegmasiae of the fibrous membranes of the head or limbs, chiefly of those parts which have the most direct correspondence with these viscera. It appears, that irritation, established in one portion of these membranes, is rapidly propagated by sympathy towards the centre of the organs supplied with the nerves of internal life. The liver, as being the most complex viscus, and that in which the capillary circulation is least active, and the filaments of the intercostal nerve most numerous, seems to be more liable to the effects of this sympathetic irritation. Its vital

properties are soon impaired, inflammation is established with more or less promptness and intensity, and abscesses are, in consequence, readily formed. The purulent collections, when they once occur, contribute doubtless to the death of the patient. They will be capable of destroying him at a later period, should he resist the primary or traumatic inflammation. We have seen many individuals, labouring under wounds in the gynghlimoid articulations of the superior or inferior extremities, die in consequence of abscess in the liver, formed, probably, after the supervention of inflammation in the wounded parts.*

Previously to entering into farther details on the causes of the formation of abscesses in the liver, we will report some cases, which will doubtless suffice to fix the opinion of practitioners.

Case 1st. One of the Prussian soldiers, treated under our immediate observation in the royal hospital of Gros-Caillou, in the course of June, 1814, had laboured, since the battle of Paris, under two fistulous wounds in the middle of the right arm, accompanied with loss of substance in the humerus and a false articulation. The two fragments appeared to be rounded on their surfaces, so as to be capable of gliding one upon the other. Both the limb and the patient were in a pretty healthy condition. With the view of causing the union of the bony fragments, a seton was employed in the treatment of this false point, constituting a remedy that originated with the English,† and has been extolled by some French writers. (*See the learned Dissertation of Doctor Laroche.*) By means therefore of a seton needle, a small piece of tape was passed through between the two portions of bone.

Inflammation supervened before the fifth day, and pro-

* It is also possible that fluids more or less heterogeneous in their character, furnished by the wound, may be conveyed to the liver by the cellular tissue, and to these traumatic causes are added the sudden suppression of perspiration, that of the more or less abundant alvine discharges and the disposition to disease in the hepatic organ.

† Baron Larrey is in error on this point. Surgery is indebted for this valuable invention to the genius of the celebrated Physick, who had recourse to it first in 1802.

See Dorsey's Elements of Surgery.

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gressed with rapidity. The two osseous fragments, and surrounding soft parts, were so much tumefied, that the engorgement extended as high as the shoulder, and as far as the fingers. Very acute pains in the right hypochondrium, accompanied with difficulty of breathing, oppression, and a very violent traumatic fever, were soon added to these local symptoms. On seeing the patient in this condition, our first object was to extract the seton, to apply emollients to the affected member, and cups with scarifications to the hypochondrium, with the employment, finally, of cooling and antispasmodic articles. These means proved unavailing, the symptoms increased in violence, and gangrene was established in the two wounds of the arm, the size of which was much augmented; the individual experienced at the same time lancinating pains in the region of the liver. We perceived, a few days subsequently, on the edge of the false ribs, a projecting fluctuating tumour, presenting, moreover, all the symptoms of abscess in the liver.

The extreme debility and decline of the patient did not warrant a recourse to the means indicated for the affection of the arm and liver. He died twenty-four hours after the invasion of the symptoms. The dissection of the arm, on the following day, revealed a profound and extensive inflammation in the membranes of the bony fragments, in which it had evidently commenced. Purulent collections extended along the arm as high as the axilla, and under the pectoral muscles.

The examination of the abdomen disclosed to us a very large abscess in the substance and centre of the large lobe of the liver, on the eve of opening into this cavity.

It is very certain, that these abscesses arose from the irritation and inflammation of the arm, since, until that period, the patient had laboured under no disease which could cause any suspicion of the least hepatic alteration.

The three following cases are those of three soldiers of the ex-guard, who, in 1811, were successively conveyed to the hospital of Gros-Caillou, in order to undergo treatment for sabre wounds received in duels.

Case 2nd. A young horseman was brought to the hospital, labouring under a wound inflicted by a sabre, which

had removed, together with the integuments, an oval piece, about an inch and a half in length, of the external table and diploe, from the middle part of the right parietal bone; the internal table was uninjured. This wound was treated as a simple one. It was covered with a pledget of linen dipped in warm sweet wine, and confined by compresses and a suitable bandage. The patient was subjected to a cooling regimen. The first ten days were spent without any occurrence of note; but on the eleventh, the suppurative process ceased, the edges of the wound became red and swollen, and fever supervened, accompanied by headache, tinnitus aurium, delirium, burning thirst, deep pain and oppression in the right hypochondrium.

We caused leeches to be applied around the wound, and cups with scarifications to the temple and right hypochondrium; the head was covered with an emollient cataplasm. Pediluvia, enemata, and sweet diluent drinks were employed; but, notwithstanding the use of these means, inflammation continued to progress with rapidity. The pains in the side were lancinating and constant. The patient soon experienced rigors and cold sweats, preceded by paroxysms of fever of a pernicious tendency. He finally died during the night between the thirtieth and thirty-first day after his wound.

The body was examined on the following day. We found the pericranium so much inflamed, that one would have supposed the vessels injected with a fine fluid. The part of the dura mater, corresponding to the internal wound, was red and tumefied. The brain exhibited no marks of disease, and its ventricles contained little serosity. We pursued our inspection in the thorax and abdomen. In the latter cavity a pretty large quantity of purulent matter was effused, which issued from a very large abscess in the convex part of the liver. The seat of suppuration extended into the proper substance of this viscus. The cause of the death of this patient may be referred to this double affection, and particularly to that of the liver.

Case 3d. A few days subsequent to the dissolution of the subject of the preceding remarks, a dragoon of the guard was conveyed to the hospital of Gros-Caillou, la-

bouring under a wound of the head inflicted by the cutting edge of a sabre. A portion of the integuments, and a pretty thick lamina of the lateral part of the right occipital bone, had been removed by the instrument. The internal table was not injured. This dragoon did not fall on receiving the blow. His wound having appeared slight, he had been located in the hall of the convalescents, and put under the charge of the surgeon of this room. Simple dressings were applied, and nothing of a particular character occurred during the first fifteen days. The wound was in a very good state, and commenced cicatrizing at its edges, when symptoms of inflammation were suddenly developed, and the right hypochondrium became painful. At first, no attention was paid to these phenomena, and they thus progressed with so much rapidity, that the fever was violent, and the inflammation in the edges of the wound assumed the utmost intensity. The pains in the side were also rendered more severe and pulsating.

No disturbance in the functions of the brain and no symptoms of effusion were manifested.

Such was the condition of the patient, when we were called to him. Local bleedings, cooling laxatives, pediluvia, and antispasmodics merely produced momentary and slight relief, and he died on the thirty-seventh day after his entrance into the hospital.

The body being examined twenty-four hours after death, we observed that there had existed, 1st, a very violent inflammation in the pericranium, the bone that had been cut, and the corresponding part of the dura mater, which participated in this affection;

2nd, A pretty large abscess in the concave face of the liver. A portion of the purulent matter had already been effused into the cavity of the abdomen.

Case 4th. A foot grenadier entered the hospital a short time after the above mentioned soldiers. He had received a longitudinal wound in the right lateral part of the forehead, caused by a sabre, which had divided the external table of the os frontis as far as the diploe. There were in the first instance some symptoms of concussion; but the subject of the injury did not fall under the stroke, and was not deprived of his reason, until some

moments subsequently, while in a tavern near the place of combat; he had repaired thither for the purpose of being dressed. The first ten days elapsed without the occurrence of more symptoms; at this period, however, the patient complained of an acute and constant pain in the bottom of the wound, in which suppuration had been suddenly arrested. Somnolency, interrupted by convulsive movements, and slight attacks of delirium prevailed, and he experienced, at the same time, oppression and a dull incessant pain in the right hypochondrium. Local depletion, and the use of diluents, mucilaginous and emollient substances applied exteriorly, moderated the inflammation. But independently of the symptoms pointed out, those of compression were developed, the patient had already lost the use of his left arm, and the leg of the same side was almost constantly in motion. Although he suffered very acute pains in his wound, he had a continual inclination to lie on the same side.

The unnatural projection of the hypochondrium, the pulsating pains, irregular rigors, and frequent desire to vomit, characterized sufficiently well the aggravated disease of the liver.

In order to fulfil the indication presented by the compression of the brain, we applied a trephine to the lower part of the seat of fracture. The perforation having been effected, there issued through it a common spoonful of purulent matter, mixed with small clots of blood. This fluid was situated between the cranium and dura mater, which latter was depressed from about five to six lines. A blister, composed of cantharides and camphor, was applied to the region of the liver, and the proper regimen continued.

The patient experienced a momentary relief; but this apparent calm was of short duration, for it was soon superseded by symptoms of well marked asthenia; such as prostration of strength, cold sweats, small pulse, colliquative diarrhoea, tumefaction of the abdomen, difficulty of breathing, and gangrene of the liver. Death soon succeeded this sinister group, and it was a source of much regret to me, that I thus had an opportunity of confirming my opinion as to the causes of hepatic abscesses supervening on wounds of the head; for the subjects of the latter had been sub-

jected to no fall or violent concussion. And, on examining the abdomen of this patient, we found a collection of purulent matter situated above the transverse mesocolon; it was furnished by a very large abscess in the greater lobe of the liver, very near the suspensory ligament.

The inspection of the cranium disclosed, besides the suppurating point of the dura mater, inflammation of this membrane and the pericranium, together with suppuration of the part of the brain corresponding to it.

It should be observed, that none of these wounded individuals fell, even under the strokes they received. The last three, moreover, according to their own account, enjoyed excellent health, previously to the accidents which occurred to them.

Doctor Aumont, one of the superior assistants in the hospital, examined the bodies of two subjects of the latter cases.

To recapitulate what we have said respecting the causes of hepatic abscesses following wounds of the head, we are of opinion :

1st. That these abscesses are but very rarely essentially owing to a blow, or direct pressure exercised on the liver, by the fall of the person injured, or by any contusing body, which may have acted violently on the right hypochondrium;*

2nd. That the origin of these abscesses should be referred to the sympathetic irritation, experienced by the viscous in which they are seated, in consequence of the inflammation established in the fibrous membranes of the cranium, or bones of the superior or inferior extremities, particularly those of the same side, and the determination towards this viscous of the ichorous miasma, or a fluid more or less acrid and subtile.

3d. It appears, finally, that the communication of the morbid principles of the injured parts with the liver is

* Should the weight of the individual's body happen to be exerted in his fall against the right hypochondrium, the liver may undergo some change, and perhaps be lacerated. But this change would then be totally independent of wounds of the head, as we have shown.

more easily effected, when they are not forced to traverse the median line of the body.

These causes and facts, which we have reported, appear to solve the important question, considered in the preceding remarks. We may, at least, suppose ourselves to have marked out the track to be pursued by those practitioners, who shall wish to verify the principles which we have advocated.

To conclude my reflections on wounds of the head, I will make a few observations on the manner of treating those caused by fire-arms and polished weapons, which injure only the membranous envelopes of the cranium, without producing a fracture in this latter part.

All wounds of the head by polished weapons should, in general, be reunited, but in such manner as not to exert too great a degree of traction on their edges. A piece of fine linen, dipped in warm wine containing sugar or honey, is the best retentive application for ordinary cuts. Should the wound, however, be very extensive, or be complicated with flaps, adhesive plaster ought previously to be employed, and in some of these cases sutures are indicated; such, for example, are wounds with large flaps thrown backwards, formed of the posterior parts of the head. The sutures, in these instances, should be preceded by the formation of a counter opening in the base of the flap, for the purpose of facilitating the escape of fluids, and should be aided by the bandages indicated.

Nearly the same treatment must be pursued in confused wounds of the same parts, viz. after having shaved the head and removed the foreign bodies, if any be present, they should be covered with linen dipped in a tonic liquid, such as wine, vinegar and water, or salt and water. It is not necessary to lay them open, unless there be culs-de-sac in some parts of the wound, or lacerations or severe contusions of the periosteum; simple dressings are preferable. Muscular power is almost totally lost, and the integuments of the head are slightly irritable; the laying open of the wounds is then of slight utility; they are, however, more speedily cured by it.

Wounds of the ears also demand particular attention. Should the external part of this organ be divided in its

thickness, it matters not in what direction, the edges of the wound should be speedily approximated by means of the interrupted suture, made with needles of my model, and of relative size. This suture should be protected by an apparatus or bandage, which would fill up the inequalities of the ear, and maintain it in a proper position. Whatsoever may be the extent of the division, provided the cut portion adheres to the remaining part of the ear by the smallest attachment whatever, re-union is accomplished in a perfect manner.

The same rules are applicable to wounds of the eye-lids, nose, and other parts of the face. The manner of treating these latter wounds has been already pointed out in different articles of my *Campaigns*.

Of the wounds of the face, caused either by cutting or contusing instruments, some are of a very remarkable character. I have already spoken of those, in which nearly the whole of the nose was cut off, in such a manner as to remain attached to the remainder of it merely by an extremely minute pedicle, and still re-union took place.

When the parietes of the mouth are divided by any instrument, whether cutting or contusing, after having rendered the wound a simple one, it is necessary to approximate its edges by a suture, which should be assisted by bandages. Several cases of the successful performance of this operation, even in gunshot wounds, have been reported in my Memoirs. I will, however, subjoin that of one of the body-guard, treated in the military hospital of Gros-Caillou.

M. de R——, one of the king's body guard, labouring under a severe gunshot wound of the face, was conveyed to the hospital of Gros-Caillou, during the winter of 1815. This individual appeared to be dying when I paid him my first visit, twelve hours after the accident. A pistol-barrel loaded with two balls, applied to the palatine arch, and embraced within its circumference by the lips and jaw, was turned slightly forwards at the moment of the discharge, from which resulted a very violent explosion in the cavity of the mouth, and the escape of two balls externally through the arch of the palate and the nose. The anterior half of the former was destroyed, and the bony

septa of the nasal fossæ, together with the part separating these from the cavity of the cranium, were broken into pieces. The exterior surface of the nose was divided into three flaps, a middle one formed of its extremity, and the septum beneath, and the remaining two by the alæ of this eminence, and the corresponding portion of the lip. The middle of the latter was totally wanting, and a void space of about two inches in circumference existed; its edges were ragged and turned over. The velum palati and base of the tongue were cleft in a parallel direction from before backwards; and the left wall of the mouth presented an opening filled with coagulated blood. Every part of the face and neck was tumefied, and contained spots of ecchymosis, and vision was obstructed in both eyes, in consequence of the swollen condition of their lids. The remaining sensitive functions were also suspended. The pulse, almost entirely absent, was nervous, and the patient in a permanent state of convulsion and anxiety; in short, every thing induced us to fear a speedy dissolution.

It was, however, a matter of urgency to examine all parts of the wound, for the purpose of extracting foreign bodies, and simplifying it, as much as possible, with the view of causing the more or less exact reunion of its edges.

Having prepared suitable dressings, I proceeded, in the first place, to the removal of several bony fragments from the palate and nasal fossæ. Some portions of the edges of the wound were laid open, and those parts removed which were irregular, or had suffered from attrition. I afterwards inserted eleven points of the interrupted suture, in order to reunite with accuracy the three flaps of the nose and the uneven and very widely separated edges of the upper lip, taking care to include in the middle part the under septum of the nose. Several intervening sutures were employed, in order that the most exact relation might exist in every portion of the wound. With the view of promoting the approximation of the two maxillary bones, I fastened a platina wire around the two canine teeth, where the loss of substance ceased. Two pieces of large gum elastic catheters were introduced into the nose, to the extremities of which I attached thread for the purpose of maintaining them in this position. These canulæ,

while aiding in the transmission of air for the purposes of respiration, contributed greatly to the preservation of the form of this organ. Small graduated compresses, placed on its sides and in the canine fossæ, and bound down and sustained by a retentive uniting bandage, completed this difficult and tedious operation.

Scarcely was it terminated when the patient experienced relief, and the nervous symptoms, indicative of tetanus, were immediately allayed. I took advantage of this moment of calm to place him in a warm semi-bath, and administered, by means of a sucking-bottle, cooling anti-spasmodic drinks containing ice. Deglutition was performed with extreme difficulty; but by dint of care and patience, it was gradually restored. The night was passed in a pretty tranquil manner; on the following day, however, febrile action, which may be called traumatic, was developed, together with symptoms of head-ache and approaching suffocation. The application of a dozen leeches around the neck, and cups with scarifications to the back of the same part and to the thorax was with eagerness put in practice; the patient was also bled from the foot, and the same drinks and purgative enemata continued.

All the symptoms were speedily dissipated, and the individual recovered the power of his senses, with the exception of that of smell, of which he is destitute. The dressings were not removed until the eighth day; the wounds had united very uniformly and almost entirely. Some adhesive straps sufficed for perfecting their cicatrization; but an abundant secretion of pus, followed by the exfoliation or removal of several splinters of the proper bones of the nose, the ossa turbinata and a part of the maxillary bone, hollowed out by the balls, took place from the interior of the nasal fossæ and the arch of the palate. The destruction of the osseous vault of the nose produced an increased flow of tears in both eyes, with fistula lachrymalis, caused by the displacement or momentary obstruction of the nasal canal. The use of the catheters, of which we have spoken, the daily replacement of the bony fragments near the root of the nose by means of a sound, and injections into the puncta lachrymalia with Anel's syringe,

re-established the course of the tears, and the fistulæ disappeared. The two maxillary bones also gradually approximated each other so as to obliterate the communication between the mouth and nasal fossæ, and to render the possession of an *obturateur* by the patient unnecessary. In fine, after an attention of two months and a half continuance, M. de R—— was restored to his family, in very good health, and without any sensible deformity.

Wounds of the Throat.

Two individuals received gun-shot wounds in the throat, in the battle of Dresden, in whom some singular phenomena were presented.

The first was an officer of light infantry. The wound occupied the left side of the larynx. It extended obliquely downwards and inwards, in the first place, under the thyroid cartilage, which appeared to me to be slightly scooped out. Its course seemed to be continued, then, under the trachea towards the thorax, where the projectile was lodged. This patient suffered from a constant compressive pain, accompanied with difficult respiration ; his face was always red, and all parts of his neck in a state of engorgement; it was impossible for him to accomplish the deglutition of solid aliment, while liquors were swallowed with difficulty.

We were incapable of discovering the true seat of the ball, either by the sound, or any other method. The patient continually pointed to the cricoid cartilage, as the point at which it was situated, and believed he felt it on assuming certain attitudes ; my examinations of this part were unavailing. In order, however, to explore every portion of the larynx corresponding to the wound, I adopted the plan of laying it open, both upwards and downwards, notwithstanding the contiguity of the branches of the thyroid artery. No advantage was derived from this method; the foreign body could not be discovered. I could not suppose it to be contained in the proper cavity of the larynx ; for, if such were the case, the patient would have laboured under more serious symptoms, which would

have proved fatal. He did not lose the power of speech, and experienced no mark of suffocation. I was induced, by every circumstance, to believe that the ball had been arrested behind the trachea, at the posterior part of its bifurcation. Indeed, a few days subsequent, this body presented itself at the bottom of the wound, where we were so fortunate as to seize it with forceps, and extract it. From this period the patient continued to improve, and quickly left the hospital, perfectly cured.

Jacques Brisnot, the second individual, was a junior sharp-shooter of the guard. He was wounded the day before the battle of the twenty-seventh of August, and was one of a small number of patients of this character, under the charge of M. Emangard, one of our surgeons-major. The danger of his situation was indicated by the very great embarrassment with which he breathed; his speech was nearly extinct, and he suffered the agonies of death. Respiration was scarcely carried on, and some bubbles of air, with a large quantity of frothy blood, escaped with difficulty, through a gunshot wound in the left side of the larynx, between the thyroid cartilage and os hyoides, which latter was fractured. The ball traversed the throat, and made its exit behind the angle of the jaw. The patient lost much blood, and was nearly suffocated, in consequence of that contained in the cavity of the larynx; the epiglottis cartilage had been removed, and the thyroid cut. The attending surgeon-major hesitated as to the manner in which he should proceed to promote a restoration of the functions of respiration, and to cause the blood effused into the larynx, to issue from it. The very happy idea, however, of cutting the thyroid cartilage, occurred to him. At that moment, the air rushed with violence from the bronchia, and pushed before it the clots of blood, which filled this canal, and were about to cause the suffocation of the patient. The surrounding parts were relieved from their congested state, respiration re-established, and the life of the patient no longer in danger. The wound gradually assumed a healthy condition, the functions were successively performed with more regularity, the edges of the wound approximated, the cicatrix pretty speedily completed, and

the patient cured in a very short time; merely a slight degree of aphonia remained.

This case proves the necessity of giving free vent to matters retained in the cavity of the larynx. In order to fulfil well the indication presented in contused wounds of this organ, with penetration of it, and extravasation of fluids, or the presence of foreign bodies, it is better to enlarge the wound on the side of this cavity towards the trachea, like the celebrated Spanish surgeon Virgilii, so far as the principal surrounding vessels or nerves permit, than to make an opening at one of the points selected for the performance of laryngotomy and bronchotomy. There would, in such a case, be two apertures in the larynx instead of one, and the functions of respiration be thus injured.

The passage of balls into the muscular and lateral parts of the neck, howsoever superficial may be the track formed by them, has almost invariably given rise to paralysis of the arm, of the same side. Experience has taught me, that the laying open of the wound, executed with care, immediately after the accident, prevents this paralytic affection, doubtless because the nervous branches, lacerated or ruptured by the projectile, do not, as in the contrary case, contract too close adhesions at the depressed portion of the cicatrix, whence results an alteration in the vital properties of the injured nerves, and those with which they are connected. In consequence, also, of the binding force and compression exercised upon them, their sensibility is destroyed, and paralysis is developed and propagated to all the parts to which the affected nerves are distributed. Moxæ, however, applied to the cicatrices, and along the course of the primitive branches of these nerves, restore their functions, and dissipate the paralysis. The employment of this remedy, in the treatment of this disease, has proved successful in many instances. The mode of using it is pointed out in another article of my *Campaigns*, and in the *Dictionnaire des Sciences Médicales* under the head of *Moxa*.

Wounds of the Thorax.

Numerous penetrating wounds of the chest have given me an opportunity of verifying the advantages of the precepts, laid down by me, for the treatment of these injuries. (See Tome III. of my *Campaigns*.) Those, that were accompanied with emphysema, exhibited some singular phenomena, which were particularly observed in the case we met with at Wilna, on our passage into Russia. I will report in this place two very remarkable cases of two soldiers, from each of whose chests we extracted a ball, and will make some reflections on the effects of the presence of this projectile in this cavity. These reflections will follow the memoir relating to the operation for empyema, contained in Tome III. of my *Campaigns*, page 442.

I believe I am the first who has made known, through the above mentioned memoir, the mechanism by which nature, aided by art, cures an individual who has been operated upon for empyema in consequence of the existence of a fluid in one of the thoracic cavities. In this paper, the circumstances are described, under which the patient offers the resources necessary for attaining the desired end, and the prognosis thus possesses a degree of accuracy not found among authors. I have here, also, pointed out the changes experienced by the viscera and parietes of the thorax during the accumulation of the fluid, and those which attend and follow its removal, until a perfect cure is accomplished. The cases I am here going to report, while justifying the principles established in my memoir, appear to me to be proper guides for young practitioners, in the new track they will have to pursue, for the extraction of foreign bodies from the thorax, where it would have appeared impossible to effect this object.

Should some of the large number of soldiers, labouring under gunshot wounds penetrating into the thorax, and accompanied by lesion of its organs and loss of the projectile in one of its cavities, escape the generally fatal accidents attendant on these injuries, they are greatly troubled by the presence of these foreign bodies, which keep up in the

part they occupy an inexhaustible supply of purulent matter with empyema, or a collection of this fluid.

If the wound, made by the ball in its passage, remain open and fistulous, the pus flows through it with greater or less difficulty, according to its situation. The prognosis is thus rendered more or less alarming.

In all cases, from the first periods, nature labours for the expulsion of the foreign body, or endeavours to prevent its impeding the functions of the parts with which it is in contact. Under the former supposition, this body is detached by the suppuration occurring in the point where it was at first arrested, and is carried by its weight to the most inferior situation; the suppurative process is carried on along its whole course, and its progress is continued, until it meets with resistance, and finds a point of support, the sensibility of which is not susceptible of exaltation. A new seat of purulent secretion is, however, established, and keeps up fistulae, or constitutes empyema of proportional extent.

This operation cannot take place, and the patient experience no pain and febrile affection, caused by the absorption of a morbific principle; hence emaciation, marasmus, and death.

When, on the contrary, the ball cannot fall into the proper cavity of the thorax, it becomes fixed in the substance of its parietes, sometimes insinuating itself between the muscles, gets into the intercostal space, is stationary in this position, and may there remain for a pretty long period, without giving rise to any remarkable symptoms (I have seen several such examples); it rarely makes its way externally.

Suppuration once occurring, the foreign substance, which causes it, continues moving about in the cavity of the thorax, and the patient will perish, if relief be not promptly afforded. Previously, however, to putting any measures in execution, the presence and respective position of the projectile should be well ascertained. In the first stages of the disease, the ball may pass through the inferior intercostal spaces; but when the parietes of the thorax are contracted, the ribs are so nearly approximated, that these

intervals can no longer give passage to it, particularly if it be of a large size.

The surgeon is then obliged to enlarge the intercostal interval, selected as the most favourable for the introduction of the proper instruments for seizing the foreign body and extracting it without much exertion. To accomplish this object, a part of one of the ribs should be removed; but must the saw, trephine, or some other means be employed for this purpose? The saw, howsoever modified, and the trephine, whatever may be its size, are equally inapplicable, in consequence of the round form of the rib, and its very great contiguity to the one in its immediate vicinity. It merely remains then to divide the rib, and this is done with more facility than would be supposed, particularly if the patient be not too far advanced in years, by employing a lenticular knife, which is one of the instruments used in trephining.

The two cases I shall report will justify these rules, and make known the progress of the symptoms produced by the presence of foreign bodies in the thorax, and the phenomena observed after their removal. The latter are similar to those which I have described in my memoir on the effects of the operation for empyema; viz. the cause of the suppuration no longer existing, the parietes of the seat of the pus assume a healthy condition, and are approximated by the contractility, elasticity, and power of the tissues. These tissues are developed in all directions, and the surrounding parts, more or less remotely situated, co-operate in this work. The cavity is gradually obliterated by the enlargement of the capillary vessels of the pleuræ, mediastinum, diaphragm, and perhaps also a part of the lung. The intercostal muscles, the action of which becomes of no consequence, lose their contractile power, the ribs approach each other, the cartilages are deprived of their curvature, and depressed towards the thoracic cavity; the nutritive process in the sternum and ribs undergoes such a change, that these bony arches, having lost their curvature, augment in thickness and assume a cylindrical form, thus contributing to the reduction of the vacancy. In fine, all the organizing forces concur, by this work of convergence, to obliterate gradually the considerable void left by the blood, pus, or

serum effused into the cavity of the thorax. The vessels come into contact, contract adhesions, and form mutual anastomoses; cicatrization extends from the interior to the exterior, and *the external wounds disappear*. At this period the patient is perfectly cured.

Case 1st. A young horseman of the ex-guard received a gunshot wound in the battle of Paris, at the foot of the hill of Sèvres. The ball, which had passed from above downwards, removed, as though it was effected by nippers, the superior half of the body of the fourth rib, about an inch and a half from its sternal cartilage. This projectile penetrated into the thorax, traversed a portion of the lung, and was, doubtless, driven against the dorsal column, towards the eighth or ninth vertebra of this region, where its progress appeared to have been arrested. This wound was accompanied with haemorrhage, extravasation of blood, frequent disposition to faint, oppression, anxiety, and spitting of blood; in short, I was told that the danger of the patient had been extreme.

He was conveyed, in the first instance, to the *abattoirs* of Paris, where he remained until August, 1814, at which period he was transferred to Gros-Caillou. This individual laboured, at that time, under a fistulous wound in the superior and right part of the chest, the purulent matter remaining in the corresponding cavity. He was exhausted by this abundant suppuration and the fever of absorption. At each dressing there issued from the wound one or several cups of pus, which the patient himself expelled by lying on his right side, and inclining his body and head. His condition was that of extreme emaciation, and he suffered from a slow paroxysmal fever. That I might be apprized of the direction and extent of this wound, I introduced a flexible sound, slightly curved, into the thorax. It passed without exertion to the lowest part, and traversed a large portion of this cavity, at the bottom of which I felt a hard metallic body; this I supposed to be the ball. It was situated nearly at the point selected for the operation for empyema, which was ascertained by measuring on the exterior with the same sound. In accordance with these indications, I thought it indispensable to make a counter-opening in the chest, at a point having the strictest rela-

tion with the seat of disease, where the foreign body was situated.

The very wide interval between the eighth and ninth ribs appeared to me the most favourable for this purpose, because the patient referred the presence of the ball to this part.

The operation for empyema being resolved on, in a consultation of surgeons assembled with this view, I performed it agreeably to the rules laid down in my Memoir. Through this opening there issued about three porringers of pus; the ball also was discovered, and removed without difficulty, by means of polypous forceps, the intercostal space being very large and the projectile flattened.

The operation was followed by symptoms of disturbance, which subsided before the third day. Pus was constantly secreted in abundance, but no longer passed through the upper wound, which speedily cicatrized. In order to aid nature in her work of obstruction, I caused different preparations of bark to be administered to the patient. The discharge of purulent matter diminished daily, the re-establishment of the general functions was perceptible, and the individual recovered his appetite and ability to sleep. The diseased side of the thorax, which projected more than the opposite one before the operation, subsided sensibly from day to day, and the ribs were brought to such a degree of approximation, that the intercostal interval, through which I performed the operation, was totally obliterated previously to the termination of the third month, and the right nipple had descended two fingers' breadth below the level of that on the left part of the chest. At this period a stilet could scarcely be passed into the wound, from which pus of a good quality and small in quantity was secreted. In short, every thing indicated a complete and very speedy cure, when this young soldier, having drunk brandy in excess, contracted an acute enteritis, accompanied with paroxysms of fever. He died in the course of December, six months after the accident, and about an hundred days subsequent to the operation.

On examining the body, we found the superior wound cicatrized on the exterior, and filled up between the ribs by a dense cellular tissue, which was, however, destroyed with

facility by the handle of a scalpel. There no longer existed any communication with the seat of the disease, extending to a very short distance from the inferior opening. The latter had contracted considerably, and the two corresponding ribs were very contiguous to each other. The pleura costalis was very much thickened, and the mediastinum depressed on the diseased side. A fungous mass, furnished doubtless by the cellular tissue of the obliterated lung, occupied the superior part of the thoracic cavity. The preparation, which I presented to the society of the medical faculty, and is deposited in their anatomical cabinet, proves the majority of the facts above laid down.*

Case 2nd. Louis Claye, aged twenty-six years, a native of Mouchy, in the department of Oise, and corporal in the former sixty-first of the line, received a gunshot wound in the battle of Moillow, in Russia, July the twenty-second, 1812. The ball entered the thorax through the space between the eighth and ninth ribs of the right side, and was arrested in its course in the corresponding cavity. This soldier, deprived of his reason, fell on this portion of his body, and remained two days on the field of battle, threatened every moment with suffocation. He was, however, removed on the second day, and conveyed to one of the hospitals of Moillow.

Three days subsequent, he was near perishing, in consequence of a very great effusion into the thorax. Assistance was fortunately afforded him by one of our surgeons-major, who skilfully introduced a probe-pointed bistoury into the wound, and enlarged it in a direction parallel to the superior edge of the inferior rib. This operation, which may be called that selected for the performance of the operation of empyema, in relation to the situation in which it is ordinarily executed, was a source of much relief to the patient. He was liberated from his impending danger, and having spent the rest of the season at Moillow, was removed to the hospitals of Kowno, Konigsberg, and Thorn.

* In Tome III. of my Campaigns there is a case, very analogous, at least as to the result, to that of this horseman.

After a stay of some weeks in the hospitals of the latter city, his wound being momentarily closed, symptoms of oppression and restraint were again experienced in the thorax. They, however, subsided on the bursting of an abscess, which formed suddenly under the edge of the false ribs. The aperture, having given passage to several pieces of clothing and a large quantity of purulent matter, was gradually closed. But the wound in the intercostal space became again patulous, and there issued from it a new collection of puriform, bloody matter; care was taken to keep up a permanent discharge of the latter, by means of a bunch of thread. Fruitless attempts had been made for the discovery of the ball, which, by the patient's account, had penetrated into the chest. Notwithstanding the symptoms, which complicated this serious injury, he was enabled to proceed from hospital to hospital, for four years, until his arrival at Paris.

From the period of his entrance into France till the year 1814, this soldier, being dismissed as incurable by the decision of a counsel of health, was restored to his parish. But the constant suffering he endured, and his desire to have the ball extracted, its weight alone proving a source of much inconvenience, induced him to repair to Paris. His efforts to gain admission into a military hospital, were at first unavailing, and I obtained, with difficulty, the favour of treating him in a private chamber of that of Gros-Caillou; he was finally admitted, June the fifteenth, 1816. In my first visit, I felt the ball by means of a probe, in the bottom of the right cavity of the thorax. The fistulous wound occupied precisely the point selected for the performance of the operation for empyema. Its aperture was very small, the secretion of pus abundant, and the patient laboured under the primary symptoms of hectic fever.

After having laid open, and enlarged the wound in the direction of the ribs, I made vain attempts to extract the foreign body. The intercostal space was by far too narrow, and the two ribs did not admit of the least separation. I seized upon the ball in a point of its surface, displaced, and brought it near the opening; but it immediately escaped from my grasp, and fell again to the bottom of the thoracic cavity. It was a matter of increased pain to me, to aban-

don the patient in this condition, inasmuch as nature had no power to expel the foreign substance from the thorax, in which it kept up a purulent empyema, and as I saw he would undoubtedly become a victim to this affection.

But how was this body to be extracted? I could solve this question with difficulty. The plan, however, of sawing through the lower rib, and thus enlarging the space at the seat of the wound, in order to give passage to the ball and forceps, with which it should be seized, had already entered my mind. But the difficulty or impossibility of executing the operation opposed this idea; for, in consequence of the proximity of the two ribs, ankylosed doubtless with the corresponding dorsal vertebrae, since they yielded in no degree whatever to the greater or less separating force of the forceps, and other instruments which I employed, a was (made even expressly for the purpose) could not act on the convex surface of one of the ribs without cutting the other. How then would it be possible to effect a total division of it, and not lacerate the internal soft parts? The application of the trephine was attended with the same obstacles, as I was convinced by a subsequent trial.

I therefore endeavoured to discover a method of operating, which might be advantageously substituted for these two modes. Reason was not wanting for entertaining the belief, that the tissue of the ribs in individuals not advanced in years, particularly in a diseased condition, could be acted on a by cutting instrument. The lenticular knife, used in removing the projecting angles which result from the application of several crowns of a trephine to the head, appeared to me perfectly appropriate for the accomplishment of my object, and on this instrument was based the plan of operating in this case. The patient being resolved, and every preparation made, I undertook this unique operation (I am not aware at least of its having yet been performed) on the twenty-second of July. The patient and assistants were placed in favourable positions, the former on the edge of his bed.

In the first place, I again enlarged the wound in the intercostal interval, and afterwards made a perpendicular incision in the parts covering the inferior rib. Its two angles were then separated, and the convex surface of this

rib laid bare to the extent of an inch and a half. Two arterial branches, from which haemorrhage took place, were first tied, and the lenticular knife (its lenticular portion having been removed) introduced between the two ribs. I then cut, layer by layer, the superior edge of the lower rib, and formed in the substance of this bone a semilunar hollow from five to six lines in depth.

Being desirous of avoiding a lesion of the intercostal artery, which runs along the internal side of the inferior costal edge, I arrested this part of the operation nearly in the middle of the rib, and made new efforts to extract the ball. But in consequence of its large size* I was incapable of drawing it through the aperture; it escaped from the strongest forceps, or the latter yielded to its resistance. In fine, I perceived the necessity of cutting out an extensive portion of the rib, even to three-fourths of its substance. Being apprehensive of injuring the intercostal artery, I stopped ultimately, two lines from the inferior border of the rib, and providing myself with new polypous forceps, seized upon the projectile, and finally succeeded in extracting it, but not without difficulty.

The obstacles, which it was necessary to surmount, might have been judged of by the abrasions observed on the ball. After its removal, I injected into the cavity of the thorax the contents of two or three syringes, consisting of tepid water, which contained the *althea officinalis*. A piece of fine linen, dipped in the same liquid, was then placed over the wound, and the dressing terminated by the application of an ordinary bandage. I prescribed for the patient, who had borne the operation with the greatest fortitude, an antispasmodic potion, mucilaginous cooling drinks, emollient enemata, anodynes, and embrocations on the abdomen with the camphorated oil of chamomile, and diet.

A calm prevailed during the period immediately succeeding the operation; but a state of disturbance supervened in the night. On visiting him the morning of the follow-

* The balls used by the Russians weigh an ounce and a quarter; ours only six drachms.

ing day, I found the pulse febrile, with thirst and general heat; he experienced acute pulsating pains in the region of the liver, and the whole circumference of the wound. Having removed the first portions of the dressings, I applied several cups with scarifications to the painful parts, and continued the use of antispasmodics and acidulated drinks containing ice.

The inflammatory symptoms were allayed, and the patient relieved. During the night of the twenty-second, a ligature around one of the muscular arteries being detached, haemorrhage supervened, yielding however to slight compression. The symptoms of inflammation appeared to be entirely dissipated; but the patient was sad and uneasy, and his pulse, though weak, continued febrile. I substituted mild tonics for the cooling drinks, and added the extract of opium to the antispasmodic potions.

The two following days were passed in tranquillity; suppuration was established, and every thing indicated a favourable progress, when, at 2 o'clock, P.M. on the 25th, going alone to the privy, he suddenly and violently bent his body to the side of the wound, and fractured the small and fragile portion of the rib, which I had hollowed out. This accident was immediately followed by the rupture of the intercostal artery, which gave rise to a hemorrhage that nearly proved fatal to the patient. Being called immediately, I was so fortunate as to suppress the bleeding, and to prevent its return, by means of the compressive and very ingenious pouch of Desault.

The pulse could scarcely be felt, the limbs were cold, and every circumstance induced me to fear a speedy death. Having terminated the dressing, I prescribed for him ethereal frictions, rich wine, cordials, and absolute rest.

The day was spent without accident. Heat and the vital forces were gradually re-established; towards the evening, however, febrile action, accompanied with an inexpressible uneasiness and acute pains in the wound and surrounding parts, was developed. Apprehending a renewal of the haemorrhage, I did not disturb the dressings. A strong antispasmodic opiate potion and mucilaginous drink, acidulated with nitric alcohol, were prescribed.

On the 26th, symptoms of asthenia manifested them-

selves; the pains in the wound, and particularly those in the hepatic region, became more intense. I still suffered the dressings to remain, but caused very large blisters to be applied to this latter region, and to the whole circumference of the wound. The medicines ordered on the preceding day were continued. A paroxysm of fever, of a pretty violent character, took place during the night between the 26th and 27th. On the following day, the prostration was evident; the tongue was covered with a saburral coat, and the patient threatened with new danger.

I removed the dressings with the necessary precautions. A large quantity of purulent matter issued through the wound, the appearance and extreme sensibility of which foreboded the invasion of hospital gangrene. Entertaining no fears of the effect of the agitation caused by an emetic, which I thought it urgent to administer, I prescribed for the succeeding day, twenty-five grains of ipecacuanha, with one grain of tart. emetic. This combination, producing copious evacuation both upwards and downwards, suddenly changed the dangerous condition of the patient. From this moment he improved, and we were enabled to administer to him bark, and other tonic substances, without difficulty. The wound was dressed with the unguent of storax, sprinkled with camphor. During the first three or four days the disease appeared stationary; but then strength gradually returned. I entertained new hopes from this period; indeed, the wound assumed a healthy state, the secretion of pus became abundant, and the matter of a better quality, and all the nervous and inflammatory symptoms were entirely dissipated. After the thirtieth day of the operation, the patient found himself progressing towards a cure; and on the 22d August, was presented to the Society of Medicine. (See the Bulletin of this academy, No. 8, year 1816.)

The vacuum, which resulted in the commencement from the evacuation of the fluids effused into the thoracic cavity, with the exception of the suppurating track extending from the ball to the fistulous wound, had become gradually filled up by the work of concentration, to which all the soft and hard parts of the parietes of this cavity had been subjected, during the four years that had elapsed since the

accident. The ribs, in fact, have lost their curvature, like the subject of the first case, and indeed, become cylindrical; the sternum is more depressed on this than on the left side; the mediastinum is inclined very much to the right, and the pulsation of the heart is no longer observed in the usual place, viz. on the left side. The diaphragm and liver have risen considerably into the cavity of the thorax, and their elevation, as well as the approximation of other parts, has rapidly increased since the operation, there being no longer any obstacle to this process. These phenomena are characterized by the total subsidence of the corresponding part of the chest, the relative situation of the right nipple, and the void observed under the edge of the false ribs of the same side; at the latter point, a projection, formed by the liver, was observed previously to the operation.

This soldier returned home, October the first, 1816; he had completely recovered. Several months subsequently he came to Paris, in the enjoyment of good health.

Wounds of the Abdomen.

Wounds of the hypochondria, accompanied at once with lesion of the thoracic and abdominal viscera, have particularly engaged my attention. Those of the right hypochondrium are more or less dangerous, according to the degree of their penetration.

The liver, which occupies this entire region, is generally injured to different depths, and the nature of the lesion should not be disregarded. Should the projectile, supposing the wound to be caused by a gunshot, penetrate obliquely from above downwards, and from before backwards, or the contrary, into the side of the thorax, it passes at first into the cavity of the chest, and may injure the vessels of its parietes, break the ribs, or wound the lung; it goes hence into the proper substance of the liver, effecting a lesion in it, of greater or less depth. In this case, there may be extravasation of sanguineous fluids in both cavities, or in only one of them. These effusions are characterized by their appropriate marks, but in every instance, howsoever superficial may be the injury of the liver, such

disturbance immediately supervenes in the functions of organic life, that in a very few moments the patient appears to be in the most imminent danger. The escape of bilious matter into the abdominal cavity proves fatal.

The skin on the surface of the body becomes, in the first instance, of a yellowish tint; the eye is sunken, sad, and filled with tears; the extremities become cold; nausea, hiccup, and anxiety are developed; the urine is bloody and scanty; the alvine excretions are destitute of their bilious hue; the pulse is small and febrile; the voice extinct; respiration short, and more or less laboured, and anxiety extreme. These symptoms are speedily aggravated, and the patient dies, if nature be not aided by art.

The first indication presented, is to lay open the wound deeply, to extract the foreign bodies with the requisite precaution, should there be any, to apply one or two dry cups afterwards over the wound, even if there be extravasated blood in the cut cellular tissue, to employ them over scarified portions of the surrounding parts, and to repeat this operation, when the local pains shall become somewhat intense. Having reduced the wound by all these means to as simple a state as possible, its edges should be approximated, and kept in their relative positions by adhesive strips, a piece of linen dipped in sweet wine, and a bandage simply retentive.

Cups, particularly, have the power to remove the blood effused into the sinuses of the wound, to relieve the vessels, weakened by the shock imparted to them by the projectile, of their engorgement, to promote the absorption of the extravasated fluids, and to prevent inflammation, or at least to diminish its effects, by the revulsion or irritation which they produce on the exterior. General blood-letting has none of these advantages, and is attended with many ill consequences. It gives rise, especially, to general debility, and disposes to asthenia. The interior of the wound should be preserved from the contact of the air, the patient put on a rigid diet, and cooling, mucilaginous, and laxative drinks, according to circumstances; in fine, the skilful administration of antispasmodic anodynes should not be neglected.

A young officer of the light infantry, wounded by a ball

in the right hypochondrium, the ninth rib being fractured, and the liver injured, during the battle of Dresden, has been cured. I was in the hospital of the officers, when he was brought thither, a few moments after the accident. The ball, traversing the hypochondrium in an artero-posterior direction, broke the most projecting part of the above mentioned rib, and left a flap in the integuments, about two inches and a half in extent. A pretty large quantity of blood was extravasated, one of the intercostal arteries having been lacerated.

In the first place, I incised the flap in the integuments occupying the interval of the two wounds. Several splinters of the fractured rib were then detached and removed. With a pair of nippers, I cut off a projecting point of a fragment of this bone, which would have pricked the parts, and impeded the dressing of the wound. I extended the inferior incision over the part from which the ball issued, in a posterior direction, in order to facilitate the escape of fluids. The edges of the wound were then brought together, an opening, however, being left in its lower part, and maintained in their relative positions, by means of a piece of linen, dipped in warm wine containing a large quantity of honey. The liver was superficially cut, as we have said, on its convex surface, immediately under the attachments of the diaphragm. Diluent, laxative, and ethereal drinks were prescribed, with rest and diet. The local pain, *anguish*, and anxiety were allayed. In general, the patient experienced relief, and spent the first three days without any occurrence of note. But symptoms of inflammation manifesting themselves at this period, cups with scarifications were again employed, by my direction, around the wound, and the laxative diluents continued. The injured parts were dressed rarely, and with the precautions indicated. This treatment was pursued a pretty long time, and with complete success, for the subject of it recovered before the seventieth day.

Wounds of the Abdomen, accompanied with Protrusion of the Omentum.

IN a case of a penetrating wound of the abdomen, with the escape of the omentum, contained in my Campaigns, I have already pointed out the advantage of suffering this adipose membrane to remain exterior to this cavity, provided it cannot be reduced at that moment, and before swelling has supervened in the protruding part, and leaving it to the resources of nature alone. It should not be neglected, however, to envelope the whole of the epiploon, that has issued from the wound, or been displaced, in fine linen spread with saffron cerate, for the purpose of preventing its adhesion to the integuments around the wound, and guarding it from the air, and violence of external bodies.

If this portion of omentum be strangulated, in consequence of the contracted state of the wound which gave passage to it, it is necessary to lay it open to an extent sufficient for the liberation of this membrane from all restraint, and rendering it capable of returning into its cavity, when nature shall recall it to its ordinary situation. These primary indications having been fulfilled, the patient should be placed in a favourable position, to be preserved by him during the rest of the treatment.

The first phenomena that are observed in an hernia of the omentum without a sac, are thickening, and an almost sudden tumefaction and puffing up of every part of the membrane. In a few days it appears dense, red, wrinkled, and quickly becomes highly sensible. These symptoms progressively augment, in a gradual manner, until the third day, the tumour then remaining stationary until the fifteenth. At this period it begins to subside; the sensibility and redness disappear by degrees, and it is observed to be speedily reduced from the circumference to the centre. The angles of the wound, in the first place, are drawn apart, and the cicatrization of its edges is continued without the intervention of any foreign body. The reduction, moreover, is accomplished with greater or less rapidity, according to

the situation of the wound, and the age and constitution of the patient.

When the wound, through which the omentum protrudes, is below the umbilical line, it returns into the abdomen with a degree of facility increased by the distance from its attachments; nature promotes its restoration, and exerts traction in proportion to its remoteness.

I have attempted an explanation of this phenomenon subsequently to the above mentioned case.* This reduction of the omentum has been observed by me to take place more promptly and with greater facility in young individuals.

Before pointing out a second case, as remarkable as that which I have just cited, I will indicate what should be done, when the protruding portion of the epiploon becomes gangrenous.

Authors recommend its excision, after having placed a ligature around its pedicle, or tying its arteries separately, if they bleed after the removal of the part. Their object in the performance of this operation is, by extirpating the entire gangrenous portion, to impede the progress of mortification towards the abdomen, and prevent the effusion of blood into this cavity.

Is the gangrene confined to the protruding omentum, or does it extend to the viscera contained in the abdominal cavity? In the former case the gangrenous portion of the epiploon on the exterior may be removed by curved scissors, without touching the living parts, so as to avoid dividing the arterial branches, in which the blood still circulates. The temporary adhesive inflammation, which is established between the omentum and edges of the wound, arrests the gangrene; the slough which remains successively comes away; the pedicle, continuing sound, is quickly and spontaneously returned, and the patient is saved. In those cases, in which gangrene has already invaded the viscera contained in the abdominal cavity, (and the marks of it are not equivocal,) nothing can be

* See Tome III. of my Campaigns.

done. The patient must be abandoned to the resources of nature, those means, however, being continued, which may promote her beneficial objects.

In no case then, except in that which we have just supposed, should the protruding portion of the omentum be cut off or tied. For, notwithstanding the precaution that may be taken to throw a ligature around the vessels *separately*, after having removed the tumour, consecutive haemorrhages may supervene and jeopard the life of the patient. If one *entire* ligature be placed around the sound part of the epiploon, profound and violent irritation, accompanied by inflammation, abscesses, and frequently by gangrene and death, supervenes. I have seen many examples to this effect. These ill consequences are developed with much care in the Memoirs of the Royal Academy of Surgery, Tome III. p. 394, quarto edition.

To recapitulate, then, the treatment of this species of wounds, the surgeon having fulfilled the indications explained above, and supposing the omentum to be healthy, should restore it to as great an extent as possible, but in a mild and gradual manner. He should envelope the part without in fine linen spread with cerate and soaked in warm wine, and wait until nature employs her resources for effecting the reduction of this membrane. He should aid her work by methodical pressure exerted on the tumour, and, if this process be too tardy, should excite it powerfully by the actual cautery applied several times, provided it be necessary. This measure is painful, and thus proves that sensibility is developed in these adipose membranes, particularly when they are exposed to the external air. We have frequently had occasion to make this remark.

The following case will confirm what we have said on the spontaneous reduction of the omentum.

M. de L_____, a young officer, was brought to the hospital of Gros-Caillou in August, 1815, nearly in a dying condition, labouring under a penetrating wound of the abdomen inflicted by a polished weapon, and attended with haemorrhage, protrusion of the omentum, and lesion of the stomach. The surgeon of the guard applied a primary apparatus, and made fruitless efforts to remove the lipothy-

mia, to which this individual had been subjected ever since a very short period after the accident. His imminent danger induced the surgeon to send for me during the night. Having lifted up the dressings, I discovered a longitudinal wound, about an inch and a half in length, in the middle and inferior part of the right hypochondrium, two fingers' breadth from the cartilage of the eighth rib. A considerable portion of the omentum had escaped from the abdominal cavity, and become strangulated between the integuments detached from the muscles, and an irregular, contracted opening, which we found in the external edge of the aponeurotic sheath covering the rectus muscle of the same side.

To this lesion were added the following symptoms, viz. weakness of the pulse, coldness of the extremities, frequent vomiting of sanguineous and bilious matter, extreme anxiety, hiccup, total loss of the voice and speech, and painful anguish; in short every thing proclaimed a speedy death.

The desperate state of the patient caused us to suspend the operation, which was indicated, until the following day. The patient spent the rest of the night in so much uneasiness, that his dissolution was expected every moment. On visiting him, however, in the morning, I found the heat and pulse slightly restored; but the local pains had become very acute, and the hiccup and vomiting of sanguineous matter continued. It was not difficult to recognize the causes of these two symptoms, and, for the purpose of remedying them, I immediately enlarged the wound in the integuments, without disturbing the omentum; the aperture in the aponeurosis, of which I have spoken, was then laid open. The omentum was liberated from its confinement, and the serious symptoms, which resulted from the strangulation, almost immediately disappeared. This operation promoted, also, the discharge of a pretty large quantity of blood effused into the abdominal cavity. (When the vessels that are ruptured in the abdomen by the cause of the wound are not large, the blood is collected in a definite space, at a greater or less distance from the opening in the vessel, and is contained in a kind of sac formed by the lymphatic effusions, around its whole circumference, and the circular adhesions between the peritoneum and

convolutions of the intestines, or in the laminæ of the omentum.) As far as I was capable of judging by the direction and depth of the wound, and the symptoms evinced, I thought the wounding instrument had injured one of the anterior points of the stomach, in its smaller curvature; and this was rendered more probable by the fact, that the first alvine evacuations, preceded by colic and internal heat, were mixed with clots of black blood, in a pretty profuse quantity.

Having performed the operation, I enveloped the omentum remaining externally, (the size of which equalled that of a large apple,) in fine linen dipped in warm wine. The patient was placed in a favourable position, and mucilaginous, acidulated, sugared drinks, emollient enemata, embrocations with oil, and diet were employed.

The symptoms were gradually allayed, all the functions re-established by degrees, and the danger of the patient appeared to be dissipated from the fifth day.

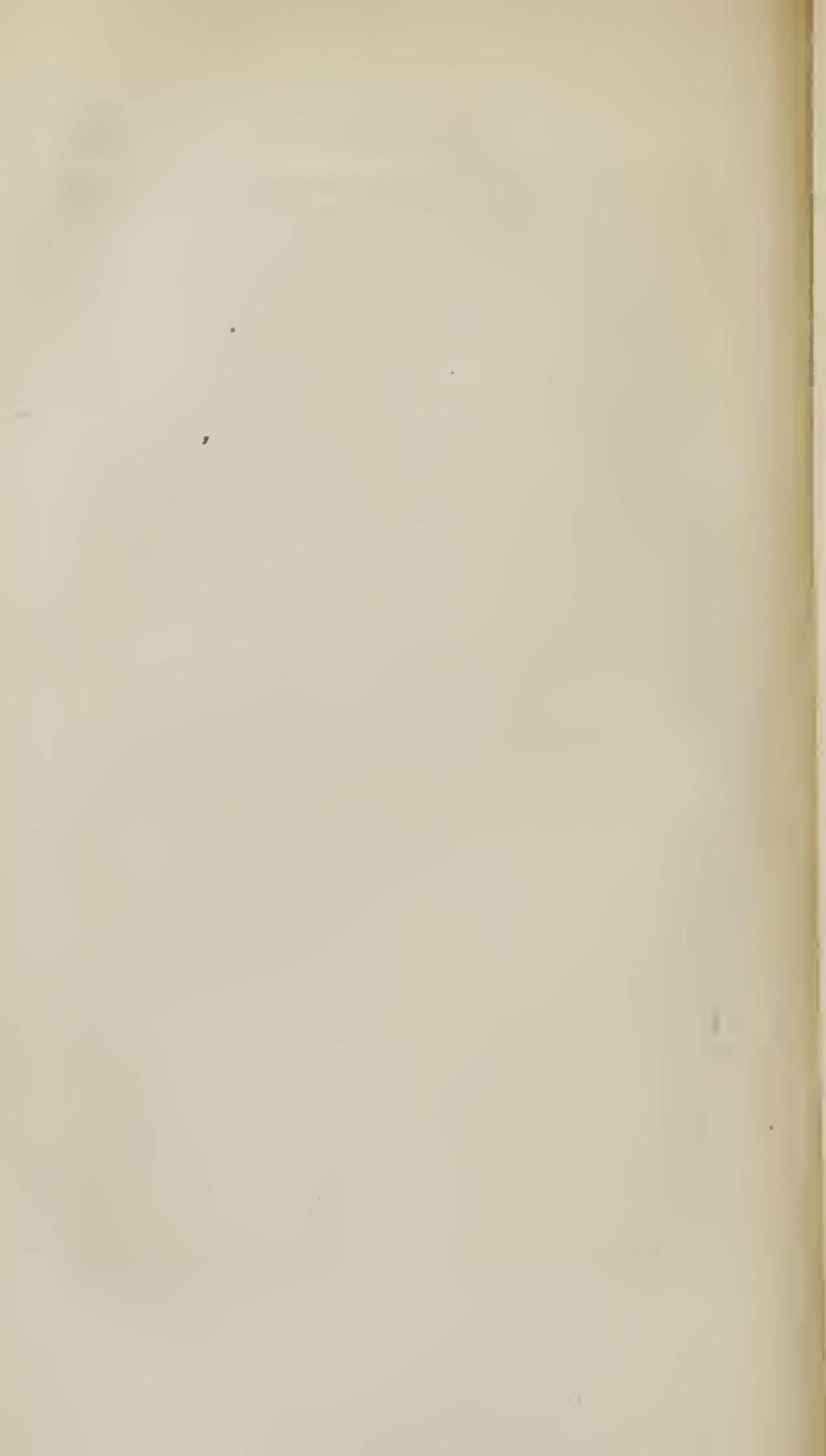
After the first twenty-four hours, the portion of omentum external to the wound became nearly as large as the fist. The tumour was red, wrinkled, and evinced marks of sensibility. The same care was continued, and the dressings conducted in a similar manner. The patient progressively improved, and gradually recovered his strength.

During the days immediately succeeding, the tumour remained in the same state; but, after the tenth day, it began to diminish in volume and density. I aided its reduction by graduated pressure, exerted upon it by means of a thick compress soaked in wine. The epiplocele returned by little and little entirely within the abdominal cavity. The wound, through which it protruded, cicatrized in proportion to the return of the omentum into this cavity, and this officer had perfectly recovered by the forty-fifth day after his entrance into the hospital of the guards. He suffered no other inconvenience than that of being obliged to wear a compressive bandage, in order to prevent a new displacement of the omentum itself, or a portion of intestine. But I had reason to believe, that he would, in the course of time, be enabled to discontinue the use of this bandage. Indeed, I learned some months subsequently, that he no longer wore it, and that he was enjoying perfect health.

To the preceding cases, I will add that of a man named Arbette, grenadier of the fourth regiment of the guard, aged twenty-eight years. He entered the hospital, May the thirteenth, labouring under a sabre-wound, in the middle of the abdomen, six lines above, and to the left of the umbilicus. The point of the instrument had penetrated obliquely, from below upwards, to the depth of about three inches, through the integuments and rectus muscle, injuring the epigastric artery, and, doubtless, the posterior border of the transverse colon, towards the duplicature of its mesocolon. A portion of the omentum as large as the double fist protruded through the external wound, and copious haemorrhage ensued, followed by syncope. The abdomen was considerably tumefied, and obscure fluctuation was observed in the umbilical region, accompanied by all the symptoms ordinarily attendant on this species of wounds. The attending surgeon very ingeniously remedied these primary symptoms, by placing a ligature around the epigastric artery, and some of those of the omentum, which he restored, in a great measure, to the abdominal cavity. The part of this membrane that remained externally was enveloped, conformably to our precepts, in fine linen, spread with cerate and confined by a retentive bandage; a cooling, mucilaginous drink was also prescribed. The state of the patient presenting nothing of a remarkable character on the following day, the same dressings were re-applied. During the night between the fourteenth and fifteenth, acute pains were experienced throughout the abdominal region; the tension augmented, the alvine evacuations were suppressed, and a traumatic febrile action supervened. Cups with scarifications to the loins, leeches to the scarified points, embrocations with the camphorated oil of camomile on the abdomen, to be frequently repeated, emollient cataplasms, anodyne enemata, mucilaginous drinks with ice, and antispasmodics, were ordered, together with a favourable position. The first days were attended with disturbance; symptoms of suppuration, however, succeeded those of inflammation. Fluctuation was felt in the external part of the epiploic tumour, which had sphacelated, and been removed (by the knife) to an extent of about three inches in diameter. I thrust my bistoury into

this point, fluctuating, though little sensible, dividing the integuments and rectus muscle, the latter being very thin, and surrounded by this seat of fluctuation. About eight ounces of greyish matter, mixed with clots of blood, issued from the aperture, disengaging a very strong odour of sulphuretted hydrogen, and blackening the silver instruments. Thus was confirmed the idea of an opening in the colon, and an effusion of blood and stercoraceous matter between the omentum and the convolutions of the small intestines, where nature had isolated and circumscribed them by circular points of adhesion, as we have remarked in speaking of the sanguineous extravasations in the abdominal cavity. The surgeon, guided by this knowledge, and enlightened, moreover, by the diagnosis of these effusions, may fearlessly plunge his bistoury into the seat of disease, for the purpose of giving vent to the extravasated fluids.

The tumefied portion of the omentum remaining on the exterior was gradually reduced, and returned into the cavity of the abdomen. The part, in which the purulent collection was situated, assumed a healthy condition, its parietes adhered together, the wound cicatrized, and the patient left the hospital perfectly cured on the fourteenth of June.



MEMOIR

ON

WOUNDS OF THE BLADDER, AND ON CERTAIN FOREIGN BODIES IN THIS VISCUS.

THE ancients considered wounds of the bladder to be fatal. This opinion is found expressed in the aphorism of Hippocrates, (18, section VI. edit. by Demercy), *cui persecuta vesica, lethale*. Though the causes of wounds have become more complicated since those remote times, surgery, by the progress it has made, and by its success in the operation of lithotomy, and treatment of wounds of the bladder, has proved that this aphorism is not constantly true. Nothing complete, however, on wounds of this organ can be found in authors. No mention is made of them in the *Nosographie Chirurgicale*, one of the most modern and erudite works. Those authors, who have spoken of these injuries, expatiate very little on their diagnosis, and do not point out all the means which should be employed in order to dissipate the primary symptoms, and prevent those that may accompany these lesions, particularly when they are complicated with the presence of foreign bodies in the bladder, the chief object of my researches.

Should the bladder be empty, that is, void of urine, it is with much difficulty injured by a sharp instrument, or a ball, which may traverse the pelvis in some direction, or at all events this accident will rarely occur. In order that it may happen, the bladder must necessarily be distended to a greater or less degree, as is generally the case with combatants. Their ardour in action and the continuance of the fight divert them from emptying it of its contents, and the fluid accumulating in its cavity, it offers so large a surface in the pelvis, that the wounding instrument can-

not enter this bony case without touching or cutting this viscus.

I shall describe, in this memoir, the phenomena attendant on wounds of the bladder, caused either by polished weapons, or by fire-arms.

Wounds inflicted by the former, such as the sword, bayonet, spear, etc. may pierce the bladder in one of the points of its circumference, or may pass through both of its parietes from side to side. In this latter case the wounds are ordinarily fatal. Howsoever prompt may be the contraction of this organ, the urine escapes through the wound corresponding to the proper cavity of the abdomen, is effused into it, and gives rise immediately to a mortal inflammation. I have had occasion to dress, on the field of battle, several soldiers, who laboured under this entire penetration of the bladder. All of them perished during the first twenty-four hours, in consequence of inflammation and gangrene. But should the wounding instrument pierce this sac towards its upper part, or at a point not covered by peritoneum, the patient may recover, unless there ensue a very copious internal haemorrhage.

The most unequivocal mark of these lesions, is the flow of urine from the wound; its emission may be momentary, intermittent, or continued, according to the situation of the wound, and the changes which supervene in the bladder. In the first case, the urine may be discharged only at the moment of the infliction of the wound, and this will take place, when the bladder, in a state of great distention, is pierced in its superior portion. The urine having escaped, the edges of the wound are approximated, and contract mutual adhesions, so as to become no more patulous, especially if this fluid finds its way through the natural passages. Should it, however, meet with obstacles to its passage through the urethra, the bladder is again filled and immoderately distended, and separating again the edges of the wound, is discharged externally. The same accident will happen, if the gum-elastic catheter, after having been introduced into this organ, be too soon removed; a new introduction, however, will divert the urine from the wound, and re-establish its natural course. In short, its escape will be constant, and may continue for a longer or shorter

period, if the aperture occupy one of the lowest parts of the bladder.

When the track of these wounds is extensive and indirect, abscesses are formed in different points, through which the urine escapes. These abscesses should be immediately opened; their return must also be prevented by introducing a gum elastic catheter through the urethra, which constitutes one of the principal means to be employed in all wounds of the bladder. Tepid baths, camphorated embrocations with oil upon the abdomen, cooling antispasmodics, the frequent use of enemata, and sometimes cups with scarifications around the wound, or bleeding, have been employed with advantage in several individuals labouring under a wound of this organ, caused by a polished weapon. I will content myself with reporting the summary of two cases of these wounds, which have appeared to me quite interesting.

Joseph Perrier, *chasseur* of the ex-guard, being mounted on a horse in a charge of cavalry, was struck in the right thigh by the lance of a Cossack. This weapon, after having passed through the skin, and tensor vaginæ muscle in the superior and external third of this member, was driven obliquely from below upwards and inwards, through the collection of inguinal glands, towards the crural arch, under which the point of the wounding instrument had penetrated deeply, in an inward and backward direction, some distance from the symphysis pubis. The anterior wall of the bladder, destitute of peritoneum, was opened by the lance; the urine escaped immediately, and, following the course of the wound, appeared externally at the aperture in the thigh. A few hours subsequent, a large quantity of blood mixed with urine was discharged through the natural passages. A perfect calm succeeded this haemorrhage, and, the contents of the bladder no longer escaping through the wound, the patient supposed himself cured.

This organ had scarcely been emptied of urine, when the edges of the wound were brought into contact, and contracted a slight mutual adhesion. At the period when suppuration was established, an abscess was formed in the track of the wound, and, opening spontaneously, suffered a quantity of urine and pus to escape. This wound

remained a long time fistulous. By means, however, of a catheter, introduced into the bladder through a counter opening made in the groin, together with methodical dressings, and the assiduous care bestowed on the patient by M. Champion, one of my distinguished pupils, he was perfectly cured.

Case 2nd. In a bull-fight, which we witnessed at Burgos, on our entrance into Spain in 1808, a soldier, slightly intoxicated, was anxious to provoke and contend with the bull in the arena, after the manner of the *torreros*. The animal, already very much irritated, rushed on the unfortunate soldier, at a moment when he wished to escape him, by bending to the ground. He was impaled by one of the bull's horns, and thrown some distance backwards. A universal shout was heard, and one of the intrepid combatants, leaping upon the animal, pierced him with his sword, and left him dead on the spot. I leaped the barrier, and ran first to the succour of the unhappy soldier, who remained insensible in the middle of the arena. I caused him to be immediately conveyed to the hospital, whither I accompanied him, and applied the first dressings.

We discovered a lacerated wound, about an inch and a half in extent, in the upper portion of the right buttock, extending obliquely, from behind forwards, and somewhat externally towards the inferior part of the groin of the same side. Pursuing my examination, I perceived that the horn, which was very pointed and curved on itself, after having torn the cellular tissue and inguinal glands, had passed under the crural arch, and penetrated into the pelvis, where its extremity had come in contact with the corresponding side of the bladder, distended with urine. It had not been pierced, but was doubtless deprived of its cellular tissue, and weakened at this point; for a part of this membranous sac protruded under the crural arch, so as to present a tumour of the size of a hen's egg. A considerable haemorrhage ensued in the first instance, arising, undoubtedly, from some of the branches of the crural artery, which were ruptured by the horn, in its course to the lower portion of the inguinal region. The patient was cold, his countenance discoloured, and pulse very small; he was labouring under ischuria, and extreme anxiety. I

administered a small quantity of pure coffee, with the view of diminishing the effects of intoxication, and re-animating his vital powers. Copious vomitings immediately supervened, with the effect of relieving the stomach, and affording comfort to the patient; merely pain and a frequent desire to urinate continued.

I laid open the internal wound, and introducing a probe along its track, for the purpose of detaching that part of the integuments of the groin which covered the hernial protrusion (cystocele), incised the projecting point of the skin, and laid bare the whole tumour. Previously to attempting its reduction, I took care to introduce a gum elastic catheter into the bladder, in order to remove its contents, suffering it to remain in this position. The displaced portion of this membranous sac was then reduced, the urine being gradually forced at the same time into its proper cavity. The patient immediately became calm, and from that moment we entertained great hopes of his recovery. The wounds were dressed with fine linen, with the view of bringing together their edges, and preventing the charpee from being entangled in the flesh. A retentive bandage terminated the dressings. I prescribed for the patient the remedies indicated, and recommended, particularly, a continuation of the use of the catheter, until the wound in the groin had entirely cicatrized, in order to prevent a new hernia of the bladder.

On my return from Madrid, six months subsequent, I again saw this individual, and found him perfectly cured.

Although the bladder had not been pierced, it was yet seriously injured, and, but for the prompt succour afforded the patient, it is probable, that this portion of the bladder, in which the urine was retained by the strangulation that had supervened, would have been ruptured spontaneously, and thus have endangered his life.

I will now endeavour to explain the modus agendi of a body discharged from a gun and effecting a lesion of the bladder, either by passing through both of its walls or by being arrested in its cavity, and will finally point out the most advantageous method of extracting this foreign substance, which I have learned from experience.

If the ball, after having penetrated one of the parietes

of this viscus, maintain its rectilinear impulse, it will pierce the other wall in a parabolic manner, and may continue its progress into the substance of the corresponding parts, making its way externally, or be buried deeply amidst the muscles.

When the ball shall have traversed the bladder from side to side, and effected its exit, the urine will immediately escape, together with blood, through one of the wounds, or through both at the same time, according to their situation. The discharge of the former fluid through the urethra is diminished or totally suppressed; the patient ordinarily emits through this passage a larger or smaller quantity of blood, and experiences acute and constant pains in the course of the wounds, frequent and painful desire to urinate, nausea, sometimes vomiting, and extreme anxiety. The latter is characterized by disquietude, paleness of the face, a spasmotic state of the pulse, and often by lamentations and mournful cries. The ball in entering or issuing out may have injured or passed through the rectum; the urine passes then into this intestine, is mingled with the excrements, with which it meets, and escapes through the anus or one of the wounds, no doubt being left as to the lesion both of the bladder and rectum.

Should the former organ be penetrated at a point corresponding to the proper cavity of the abdomen, as for instance, on its posterior face, covered with peritoneum, the urine is generally effused into this cavity, and causes inflammation of the peritoneal membrane, with which it is in contact. This inflammation is rapidly propagated from part to part, involving all the viscera; hence flatulence, uneasiness, oppression, internal heat, stupor, gangrene, anguish, and death, which latter simultaneously destroys the organs of animal and organic life. The former are infected by a kind of metastasis of the urinary principle to the brain. The particular odour, which denotes the presence of this volatile matter, is manifested over the whole of the body, whence it passes off by cutaneous exhalation.

These doubtless are the kinds of wounds noticed by Hippocrates, Aristotle and Galen. When, however, that part of the bladder which is not covered by peritoneum is injured, so as to have no communication with the inte-

rior of the abdominal cavity, wounds of this organ, as we have already remarked, are curable.

Although the urine passes at first through the wounds, it is in the first stages rarely infiltrated into the cellular tissue along their track, since their edges and walls, being rubbed by the ball, are engorged and tumefied, and thus oppose the passage of this fluid. When the sloughs are detached, it again flows through the wounds, and at this period may penetrate into the cellular tissue and give rise to serious consequences. The latter may be prevented by introducing a gum elastic catheter into the urethra; but this is not always accomplished with facility; as, for example, when the catheter comes in contact with splinters of bone in the course of the canal, or when the neck of the bladder is inflamed.

By the laceration of the arterial branches or varicose vessels of this membranous sac, an extravasation of blood sometimes takes place into its cavity, whence results deep seated irritation, accompanied by heat and inflammation. This internal haemorrhage will be recognized by the marks of retention, by those of inflammation, by the smallness of the pulse, the pallor of the face, and dryness of the wounds. The blood is rarely coagulated in the bladder, in consequence of its being mingled with the urine; its discharge may then be facilitated by the catheter. Here tepid, emollient, and anodyne injections may be suitable. These accidents complicate, more or less, wounds of the bladder, and render their treatment difficult.

In all cases, the points of entrance and exit of the ball should be deeply laid open, with the precaution doubtless not to injure essential parts. This measure prevents the serious engorgement and inflammation, which ordinarily supervene when it is neglected. It empties the vessels and acts as a local bleeding, proving much more salutary than the sanguine depletion from one of the veins of the arm or leg. The sloughs are detached with greater facility, and expelled externally with less difficulty; in short, the cicatrization of these wounds must subsequently be more prompt and exact.

Fine linen applied to each wound, with soft charpee, compresses, and a retentive bandage, constitutes the first

dressings. The patient should be subjected to a cooling, mucilaginous regimen, and emollient enemata, vapour baths and embrocations, with the camphorated oil of chamomile on the abdomen. The first three or four days are attended with very great disturbance. During this first stage, which is that of inflammation, no examination must be made, nor the wound probed; the irritation should be suffered to pass by, and the establishment of suppuration awaited. At the period when the sloughs are detached, the flexible catheter should be introduced into the bladder, through the urethra; it diverts the urine from the internal wounds, prevents fistulæ and infiltration of this fluid, and accelerates the cicatrization of the injured parts. This plan contributed greatly to the cure of several soldiers of the army in Egypt, who laboured under wounds of the bladder. Some cases of these accidents are inserted in the second volume of my Campaigns, page 162. The most remarkable is that of a sub-officer, whose bladder and rectum, had been traversed by a ball. He has been cured without any defect. I will give in this place, the summary of a very analogous case, which was furnished me, during the campaign of 1813, in the person of M. Burnot, lieutenant of the 26th regiment of light infantry. This officer was wounded in the battle of Hanau, October 30th, by a bullet, which passed through the scrotum, dividing the right spermatic cord, pursued an oblique course, hollowing out the inferior ramus of the pubes, near its symphysis, cut the urethra, entered the bladder, traversed its bas-fond backwards, and to the left, perforated both walls of the rectum, and made its way to the top of the left buttock, about an inch and a half from the margin of the anus. The escape of urine and stercoraceous matter through the wounds and intestine, left no doubt as to the lesion of the rectum and bladder. This patient was conveyed to the hospitals of Mentz, where I had an opportunity of pursuing and directing his treatment. The small quantity of urine, that had been discharged through the wound in the scrotum, sufficed for the destruction of the cellular tissue of these parts. The extirpation of the testicle, which had likewise been deprived of life by the rupture of the cord, together with deep scarifications, arrested the progress of gangrene. The sloughs

were detached, all the symptoms allayed, and the patient, of whom, until this period, little hope was entertained, removed from danger. I introduced a gum elastic catheter into the urethra, and prescribed emollient enemata and the regimen indicated. The urine and excrements passed, for some time, through the posterior wound; fragments of bone also, issued through the urethra at different periods, their removal being accompanied with acute pains and effusion of blood. The wound in the scrotum had the precedence in cicatrization; that in the buttock remained a long time fistulous, and the patient was annoyed with an almost constant urinary diarrhoea. The catheter was uninterruptedly employed, and promoted the healing of the wounds in the bladder, and the escape of foreign bodies. M. Dugat, the private surgeon of this individual, frequently found small pieces of bone entangled in the perforations of the instrument. In fine, after a treatment of two month's continuance, this officer was completely cured. I saw in Metz, his certificate of relative sickness, at the time of our departure from this city in January, 1814.

M. Bastier, surgeon-major of a battalion serving in Italy, has translated for me, from the German Gazette of Salzburg, No. 84, year 1812, a case of a wound, similar to that which I have just described. "The ball entered through the pubes, and issued out through the sacrum. The urine and faecal matter passed through the posterior, the former only through the anterior wound. The inferior extremitiees were paralysed; but the patient recovered, notwithstanding all these unfavourable circumstances."

The following case, extracted from the Memoirs of the Academy of Sciences, in the year 1725, affords us proof, that wounds of the bladder, though caused by fire-arms, may be attended with dangerous haemorrhagies.

"A mason of Lausanne, aged twenty-five years, received, in 1724, a gunshot wound in his abdomen. The ball, which weighed an ounce, entered the left part of this cavity, an inch from the pubes, and two fingers' breadth from the linea alba, passing through the rectus muscle, the epigastric artery, the fundus of the bladder, and the sacrum, in their left lateral parts, and issued out at a point, on the side of the anus, nearly three inches from,

"and above it. The coats of the spermatic vessels of the "left side were wounded, and inflammation of the testicle "and scrotum thus produced. The bladder was consider- "ably lacerated, for the urine escaped only through the "wounds; the intestines were not injured."

The patient suffered profuse haemorrhage during the first days. It appeared, that the blood had accumulated in the bladder, and caused the serious symptoms which ordinarily accompany these haemorrhages; viz. sleeplessness, delirium, ardent thirst, retention of blood and urine in the bladder, tension of the abdomen, &c. The subject of this injury, in short, was in the greatest danger.

"M. Martin, the physician of the patient, having fruit- lessly had recourse to a great variety of means, injected "emollient substances into the bladder. According to "him, they promoted the dilatation of the wounds of this "viscus, and the discharge of blood and urine through these "passages, and the urethra. From this period, the alarming "symptoms disappeared, and the individual recovered."

In reading this case, it is difficult to decide, whether the discharge of these fluids was effected by the introduction of the catheter into the bladder before the injections were employed, which is probable, or whether the favourable change, which suddenly took place in the patient, was owing to these injections, a very beneficial remedy, by the by, when opportunely administered. I will not attempt to solve these questions.

How can we explain the fact, that a foreign body, which has perforated the bladder in one of its parts, may be arrested in its cavity? It is easily conceived, that a fragment of bone, a small piece of coin, a button, or any other minute and flattened body, detached by the ball, and driven before it into the bladder, after having penetrated one of the walls of this organ, by one of its angles or edges, turns on its axis through the impulse imparted to it, and by the body of fluid it traverses, is generally made to present its largest surface to the other wall of the bladder, and, in fine, being there arrested, falls to the bottom of this organ. But how can balls or pieces of lead, that have preserved their spherical form, be arrested in this membranous sac, without traversing it from side to side? May it not be said, that

their passage through the hard or soft parietes of the pelvis has already diminished their force; and that, having reached the cavity of the bladder, the fluid contained in it assists in arresting their further progress.

If the foreign bodies be small balls, or pieces of lead, they may be expelled externally, through the urethra, or may be extracted through the same passage, by the aid of those means which art employs with advantage. The example of a captain, cited in *Theophilus Bonnet*, is one of the most remarkable.

“This officer was wounded in the right side of the abdomen, whence the ball penetrated into the bladder. The wound closed and cicatrized, and the patient recovered very well. But at the expiration of a certain period, he experienced acute pains, similar to those that are caused by the presence of a stone in the bladder. After great efforts, he discharged, through the urethra, a leaden ball of the size of a pea.”

Small pieces of this metal will be expelled with more facility, if the gum elastic catheter be used; this instrument will promote their exit, and should be gradually increased in size. The foreign bodies may then pass very easily through the urethra, or be entangled in the holes of the catheter. By this method, several individuals under my care, labouring under calculus, have been spared much suffering; gravel of a pretty large size escaped through the canal, or were removed by the catheter.

The Egyptians, as we are told by *Prosper Alpinus*, extracted, in his day, urinary calculi, without making any incision,* but by means of a dilating instrument. It is probable they had recourse to this plan only when the stones were small.† The Egyptians, at the present time, are not conversant with this practice; the stone, moreover, must be a very uncommon disease among this people, for we did not hear it spoken of during our stay in Egypt.

What may be the consequence of the continuance of a

* *Medicina Ægyptiorum: de lapidis vesicæ extractione absque ulla incisione, apud Ægyptios.* (Cap. XIV.)

† In this case, it might be pursued with advantage in the female.

ball in the bladder, either through neglect to extract it, or because the surgeon is ignorant of its presence in this viscus? The results will be fatal, if the foreign body be large and uneven. An irritation, in proportion to its weight, its mass, the nature of its substance, and its form, will speedily supervene. Inflammation immediately takes place, suppuration succeeds it, and is followed by ulceration, perforation of the bladder, the escape of the foreign body into the cellular tissue of the pelvis, accompanied by an infiltration of urine into the same structure, causing gangrene and death. This has been, doubtless, the most common termination in the army. Under favourable circumstances, the ball may reach the perineum, cause a gangrenous abscess, which is opened spontaneously, or by the surgeon, and make its way externally; it may also pass into the rectum.

Should the foreign body be of small size, with smooth surfaces, the integrity of the bladder is not thus altered. The substance contained in this organ is speedily covered with an earthy layer, formed of the sediment from the calcareous matter, which is precipitated from the urine on the lead. The deposits gradually augment, and a stone, thus progressively increasing in volume, grows around this nucleus. The symptoms, indicative of its presence in the bladder, are identical with those which characterize the existence of calculus.

It is more difficult to seize on those that depend on the presence of a small or large ball, uncovered, or without envelope, in this viscus. The pains are, doubtless, more acute, since the metallic substance, in immediate contact with the mucous membrane of the bladder, produces a more severe irritation than that caused by a calcareous body. The almost habitual contraction and spasm of the bladder makes the bullet fall to its bas-fond, and it eludes examinations. It may, moreover, be covered on one of its surfaces by blood, albumen, a piece of cloth, wad, or stuff, or by a membranous pellicle, so that the sound or catheter may touch it without a sensible shock being produced. The experienced hand, however, should recognize its existence. It is sufficient for the surgeon to direct the extremity of the sound towards the bas-fond of the bladder, and,

introducing his finger into the rectum, to raise up the ball, in order that it may be touched by the instrument; this body, besides, projects towards the intestine. The patient, in fine, is made to undergo different movements, during which he declares his sensation, as though a ball were rolling about internally. These examinations, added to the symptoms which characterize a gunshot wound of the abdomen or pelvis, without the escape of the ball, and accompanied with lesion of the bladder, should confirm the existence of the foreign body in this viscus.

Under the supposition, that these foreign substances consist constantly of lead, ought their dissolution to be attempted, by means of mercury, previously to performing the operation, as some authors have advised; for, these two substances being placed together in relative proportion, the lead is dissolved in a few moments, and a metallic liquid formed, which may be discharged through the urethra?

The experiments of Ledran, the most zealous advocate for the employment of this method,* incur doubt as to their exactness and faithfulness. Experiments, moreover, of this nature are executed with difficulty, and those of Ledran, having for their object the removal of merely a small piece of a leaden sound, weighing about two drachms, cannot serve as a rule for attempting the solution of a ball counterpoising, at least, an ounce weight. But, supposing that this body may be rendered liquid in the bladder, is there any certainty of finding it constantly without an envelope, even immediately after the accident? Undoubtedly not. On the contrary, I think it is covered, after the lapse of the first twenty-four hours, either by coagulated blood, or, perhaps, even by a portion of the mucous membrane detached by the ball from the parietes of the bladder. In short, the foreign body may possibly be of iron, copper, or some other substance differing from lead. The ball may also have forced pieces of bone or clothing into the bladder, which will give rise to symptoms as alarming as those caused by the projectile. Injections of quicksilver into this viscus, will be not only useless in all cases,

* See Vol. XIX. of the Bibliotheque of Plancus, p. 589.

but will prove injurious, as it augments the mass and weight of the foreign body, and thus aggravates the symptoms. They should then be rejected.

We have remarked what was necessary to be done for the removal of small pieces of lead, or other diminutive bodies. But, when these substances are so large as to render their passage through the urethra impossible, another point should be provided for their exit.

Let us now inquire which is the most sure and advantageous passage, through which their extraction is to be effected. Is it that caused by the entrance of the ball, supposing it to have penetrated into the abdomen at a point corresponding to the bladder? Many authors, and among these some of the most celebrated, are of this opinion. I will refrain from citing them, as this measure would have no influence in fixing the opinion of practitioners on the following reflections.

Whatever may be the direction of the external wound, through which the ball has passed, it is almost impossible to find it in a sufficiently strict relation with that in the bladder, for the surgeon to be capable of introducing his instruments from one into the other, and searching for the ball in the bottom of this viscus. Because, 1st. The two wounds are no longer on a line from the period of the evacuation of the urine, at which time the bladder subsides, contracts, and removes itself from the external wound. 2nd, Because the wounds, both external and internal, shrink and are almost entirely closed by the contraction of the parts. Examinations are thus rendered difficult and fruitless, and after the wound in the abdomen is laid open, and that in the bladder shall be met with, it will be indispensably necessary to enlarge it, for the purpose of introducing the forceps or pincers. This step will be dangerous, especially if inflammation be developed, or pretty large vessels of the parietes of this organ cut, and will moreover promote the escape of urine into the cellular tissue of the pelvis.

Again, the ball having been extracted through this passage, all circumstances being favourable to the execution of the object, a piece of clothing, or some other soft substance, which may have evaded the forceps and the exami-

nations of the surgeon, may remain in the bladder, and serve as a nucleus for the formation of a stone, requiring subsequently the operation for this affection. The patient will thus be subjected to two operations; whereas, a counter-opening, made in the lower part of this membranous sac, prevents all the disadvantages of which we have spoken, and has the double advantage of facilitating the removal of all foreign bodies, and the cicatrization of the wound caused in the bladder by the ball.

I propose, then, as the most simple and sure method, the sub-pubic lateral operation for stone, which I execute with but one bistoury, a staff, and forceps. This mode, which in my hands has been attended with constant success, is rarely accompanied by any unfavourable occurrence. A slight haemorrhage from the transverse artery of the perineum occasionally takes place; but it is arrested with facility, and may be prevented by applying a ligature to the vessel after the operation. In order to obtain all the success to be hoped for, the patient should be placed in an emollient gelatinous bath nearly cold, and, as wounds of the bladder are often accompanied by serious inflammation, the surgeon should not wait until it is manifested, in order to perform this operation.

I do not know an example of an operation for stone executed immediately for the extraction of a ball that has been in the bladder a few moments, or a very few days.

Numerous instances are to be found in authors, in which lithotomy has been performed with the intention of removing calculi, formed around a nucleus consisting of portions of ball, entire balls, or pieces of lead.

One case only, the history of which I will briefly relate, declares the execution of this operation for the purpose of extracting a ball contained in the bladder. Still, it did not take place until a long time subsequently; whereas the operation which I shall describe, after having reported the summary of the first case, was performed a few days after the accident.

Case 1st. "A German soldier received, in 1800, a gun-shot wound at the distance of twenty steps. The ball "perforated the sacrum nearly at the junction of the third "and fourth false vertebræ of this bone, passed then

"through the rectum, and penetrated into the bladder. The wounds had cicatrized at the expiration of four weeks. The patient experienced, during this period, acute pains in the pelvis, together with the sensation of a round body rolling about in the bladder, when the patient attempted any movements. The pains continued after his cure; but he gradually lost the perception of the foreign substance. Ten years subsequently, the surgeons of the institution of Wertheim perceived that the hard body, which they felt on the side of the neck of the bladder, was the ball. The operation of lithotomy was successfully performed by Langenbeck, and the stone, as large as a hen's egg of small size, embracing the ball, which was of the ordinary caliber, removed."

The substance of my case is as follows. While passing through the wards of the grand hospital of Witepsk in Russia, on the third of August, 1812, I was arrested by the painful cries of a wounded officer, M. Guenou, lieutenant in the 92nd Regiment of infantry of the line. I went immediately to this patient, and examined him with care. He was labouring under a gunshot wound in the internal and superior part of the right groin, extending obliquely inwards towards the cavity of the pelvis. The careful introduction of a probe apprized me of the excavation in the pubis, and the existence of a track which appeared to conduct the instrument into the bladder. The lesion of this organ moreover could not be doubted; for through the exterior wound, though surrounded by a black slough, there escaped a fluid that consisted of blood and urine. The patient suffered extremely acute and constant pains in the region of the bladder, with continual desire to urinate. The ordinary contents of the bladder, mingled with blood, flowed by small interrupted jets, a circumstance which forced piercing cries from the individual. His pulse was nervous and febrile; heat and thirst began to be developed; paleness of the countenance, however, still existed; the voice was hoarse and interrupted. Having been deprived of sleep since the occurrence of the accident, he was in a state of very painful anxiety. When he moved to the right or left, he felt, as he said, a kind of ball rolling about internally.

I learned from him, that all these symptoms resulted from a gunshot wound, which he received in the battle of Witepsk, July 30th, 1812, at a distance of about seventy paces, and that the ball did not make its exit. These different details caused, in the first instance, the conjecture on my part, that the ball, which produced the wound in the groin, had been arrested in the bladder; I sounded the patient in order to be convinced on this point. I had some difficulty in feeling the foreign body; the shock, however, communicated by the instrument to my hand produced a sound, though obscure and scarcely sensible.

Previously to performing the operation of lithotomy, which I looked upon as indispensable and urgent, I was desirous of being enlightened by the knowledge of several of my medical brethren, who were in consequence assembled on the following day, August the fourth. My friend, Doctor Ribes, formed one of the consultation. The necessity for the operation was perceived, and it was decided that it should be performed immediately. Every thing having been directly prepared, the operation was executed in less than two minutes, and the ball, which I have deposited in the cabinet of the school of medicine, presented to the patient. A small portion of it was observed to be encrusted with bone, and one of its sides to be covered with blood; on the other were placed earthy molecules. This envelope would have rendered unavailing the injection of quicksilver, proposed by a member of the consultation. The extraction of the ball was followed by the removal of a small splinter of bone, a piece of stuff, and some clots of black blood. I injected an emollient mixture twice into the bladder, and applied fine linen over the wound, with compresses and the T bandage. The patient was laid in a proper position, and the regimen indicated prescribed for him. No accident occurred, with the exception of a slight hæmorrhage, which supervened on the same day, and was arrested by me with facility. Febrile action was developed on the third day, and suppuration established; the wound assumed a healthy condition several days subsequent, and from the seventh day the urine began to flow through the urethra. Cicatrization was not tardily effected, and on the twenty-second day after the

operation, M. Guenou left the hospital perfectly cured, and proceeded to his regiment. From it he wrote me while in Moscow, for the purpose of offering his thanks, and begging me to solicit for him the decoration of the Legion of Honour, which he obtained.

A sergeant-major of the twentieth regiment of the line lay in the same ward, in which I had operated on M. Guenou. Encouraged by the instantaneous success of the operation performed on his companion, he signified his desire to undergo it also, assuring me, that for twenty years he had been labouring under a stone, which had not been recognized at Metz, Mezieres, and Besançou, where he was garrisoned at different periods.

I sounded this sub-officer at the same moment, and was convinced, after a slight examination, that he was not deceived. I invited the surgeons, who had assembled for the former consultation, to visit him. They agreed with me as to the existence of the calculus, and the necessity for the operation, which the sergeant demanded with importunity. It was performed on the following day, in a manner similar to that pursued in the case of the officer. I had some difficulty in seizing the ball with the forceps. It appeared to me to be enveloped in a kind of membranous pellicle, which doubtless had caused it to evade the examinations of the practitioners in the hospitals of the above mentioned cities; it was, however, extracted pretty promptly. The patient recovered without any remarkable occurrence.

The stone seemed to present some peculiarities seldom met with, as respected its nucleus, specific gravity, colour, and density; I presented it to the faculty. The nucleus consisted of a collection of grains, having a ferruginous appearance.

REFLECTIONS

ON WOUNDS OF THE ARTERIES, AND SOME SINGULAR
ANEURISMS.

As it would be useless to repeat all that authors have said on wounds of the arteries, I shall restrict myself to a notice of those rules, which I think to be the most beneficial in the treatment of injuries of this character.

I. When the tube of an artery is cut through, or entirely destroyed by the wounding instrument, and hæmorrhage proportional to the calibre of the vessel, or other particular circumstances, has occurred, its two extremities experience a kind of retraction, and its parietes are brought into contact with greater or less promptitude.

This retraction is promoted by immediate compression or constriction, exercised either by an external mechanical cause, or by the contraction of the surrounding muscular fibres. The direct constriction has a more or less prompt and efficacious effect, since the internal coat of the artery is puckered and inflamed almost immediately. It has frequently happened, that the ligatures, in consequence of hasty transportation, or some other accidental cause, have been detached from the arteries in cases of amputation on the field of battle, a few hours after the operation, without the supervention of hæmorrhage. To prevent this accident, however, which moreover may take place in the first moments, particularly if the ligatures are torn away, I cut them off on a level with the wound in the stump, so that they may be subjected to no dragging force. This solution of continuity in the arteries, with destruction of a portion of their tube, is followed in the two separated extremities by a contraction more powerful in proportion to the distention of the vessel by the wounding instrument. This is what occurs, when the division of the vessel is caused by bodies propelled from guns, such as balls, pieces

of iron, projectiles from a howitzer, etc. In this case, the primary haemorrhage continues but for a few moments, and, unless new causes of asthenia impede adhesive inflammation, the cavity in the two ends of the vessel is completely obliterated, and haemorrhage is not renewed. When, however, arteries are ruptured in compact tissues, no retraction takes place, the haemorrhage continues, and is arrested with very great difficulty, a phenomenon I have frequently observed in the vessels of a hairy subject. Finally, the artery retracts very little in its length, but contracts strongly, twisting on itself by a spiral movement, which is visibly augmented by drawing at its extremity. Thus, when the artery has been detached or isolated from its cellular adhesions, and much distended previously to being ruptured or cut, the end corresponding to the heart is observed to undergo the torsion of which we have spoken. I have often seen this phenomenon in gunshot wounds, and in those of a lacerated character. It proves, first, that the proper coat of the arteries is composed, as we have elsewhere remarked, of motive spiral fibres, formed as well by small arteries as elementary fibres, and resembling those of the muscular coat of the intestines, or radiating fibres of the iris. The researches and beautiful injections of Prochaska support this assertion. Second, that it is not a clot of blood which arrests the haemorrhage, for none exists in the interior of these vessels thus retracted, at least, in the first instance; but that, to this kind of particular contraction, is owing the cessation of the haemorrhagy.

II. If the artery be opened, or wounded only in a part of its diameter, the haemorrhage is arrested with very great difficulty, or is not stopped at all, and the patient is constantly in danger. Nature always endeavours to cause a contraction of the arterial tube, and a union between its parietes. The torsion would certainly be more prompt and complete were the vessel totally divided; but, notwithstanding the obstacle offered by the portion of the artery continuous at both ends, the aperture, or wound, may be so

* See the account of the spontaneous causes effecting a stoppage of haemorrhage in Tome II. of this work, p. 379.

closed as no longer to permit the passage of blood, as happens in the veins after the operation of blood-letting. Its edges are approximated by the constriction and twisting of the vessel, and, in short, contract adhesions with the membranes, or surrounding cellular tissue, particularly if the opening be small, as a prick, for example.

In this case, the calibre of the vessel is preserved, and the blood may continue to flow through it, a circumstance of very rare occurrence, for we have observed it but in three instances. I will, hereafter, report the summary of the cases we have collected, in which this took place; but I repeat, that the clot of blood does not arrest the haemorrhage, and the indications will be according to these facts.

In the first instance, the whole extent of the wound should be examined with care, and, if nothing appear to be capable of destroying the adhesive inflammation commenced in the vessel, the surgeon, after laying open the angles of the wound, should content himself with covering it with ordinary dressings, and obliging the patient to observe the most absolute repose.

If, on the contrary, the haemorrhage be spontaneously renewed, a ligature should be placed, not only on the superior extremity of the artery, but on the inferior end also, especially if the vessel be of a large calibre.

This precaution is less requisite in the case of small arteries, in which the blood retrogrades with more difficulty.

III. Should the artery be merely cut, the surgeon, after having laid it bare, must employ a ligature above and below the aperture, and then divide the vessel between these two bands, *according to the precept of Aetius.** If the artery be perfectly isolated and very manifest, the operator may commence with dividing it, and afterwards tie its two extremities. This measure is more prompt and sure, and should be pursued, unless circumstances are pretty favourable to the preservation of the calibre of the vessel. In this case, the application of the ligature should be suspended, and the kind efforts of nature aided by all the means which art and the genius of the surgeon may suggest.

* See the History of Surgery, by Peyrilhus, Tom. II. p. 643.

In all instances, the laying open of the wound complicated with lesion of an artery is constantly indicated, and however large may be the clot of blood which fills the wound, it is insufficient for arresting the hæmorrhage. Although the advocates of this opinion assert its capability in this respect, the blood cannot only gush through these clots, but the presence of this carbonized fluid in the interstices of the muscles, and in cavities, gives rise to the alarming symptoms, of which we have frequently had occasion to speak. Under these circumstances, the surgeon should speedily remove all the clots, lay bare the artery, if there be reason for doing so, and apply a ligature immediately. It is useless to employ a second ligature with the view of guarding against accidents; for, if the first fail, or if it cut the vessel, hæmorrhage will not be prevented, and, moreover, a new ligature should be directly placed around it. If this ligature of safety touch the artery when denuded or inflamed, ulceration, accompanied by hæmorrhage, may result, as we saw in a patient at Dresden.

Should the artery be of a large calibre, and in a state of incipient inflammation, a circumstance to be determined by the state of the parts, the ligature ought not to be applied immediately upon the vessel, since its division would be effected before the accomplishment of internal adhesion, and the patient exposed to consecutive hæmorrhagies. It is requisite, under such circumstances, to place an intermediate body between the ligature and artery, for the purpose of protecting its tunics. I have employed with this view, for a long period, a small roll of the plaster of *diapalma*, and particularly recommend its use, when a portion of the arterial tube is to be embraced by means of the needle; for, when the ligature may be applied, by employing dissecting forceps to the extremity of the vessel, this precaution is useless.

IV. When the arteries are small, and deeply seated at the bottom of fleshy parts, it is sometimes difficult, if not impossible, except by incurring great hazard, to lay bare the injured vessel, for the purpose of applying a ligature to it. In this case, I employ, with much success, a small tent of charpee, spread with a balsamic substance, and containing a few drops of sulphuric acid; it is carried down

by the finger, until it touches the extremity of the opened vessel, which is known by its pulsation. The hæmorrhage is instantly arrested, and rarely again occurs. This measure has perfectly succeeded in my hands, in a great number of desperate cases. The dressing should be completed by a retentive and moderately tight bandage.

Cold air, ablutions with vinegar and water, cold water, or slight compression, which are always insufficient in cases of hæmorrhage from vessels of some size, suffice for arresting it when taking place from those of very small volume. Thus, I entirely disapprove of the plan of employing no ligatures on the arteries in amputation of a limb, and endeavouring to obliterate them by the flaps of the stump, which are brought together immediately and forcibly, as we have seen done in Saxony, Poland, and Russia.

Case 1st. During the campaign in Saxony, in 1813, a young soldier of the ex-guard, named Francis Fourmy, was brought to the hospital of this body, established in the city of Dresden, labouring under a gunshot wound in the left thigh, which he received in battle under the walls of this city. The ball traversed the limb obliquely, in its inferior third, from within outwards, so that the femoral artery was destroyed some lines above its passage into the aponeurosis of the triceps adductor. A very copious hæmorrhage ensued in the first instance, and was succeeded by general debility, coldness of the extremity, and absence of pulsations in the popliteal artery. The anterior wound having been laid open, and the clots of blood, filling the interval of the two openings removed, the finger discovered a void, which was produced by the projectile, in the internal edge of the femur, at the point occupied by the artery. A small, conical, and slightly pulsating eminence was discovered, somewhat above this hollow, at the bottom of the wound, consisting of the ruptured and retracted extremity of the artery. No new hæmorrhage ensuing, I confined myself to the application of simply retentive dressings, and wished to await the occurrence of events. I prescribed a soothing regimen, and caused the patient to observe the strictest quiet, taking care to dress his wound personally, during the days immediately succeeding. The hæmorrhage was not renewed, the wound cicatrized, and the patient

left the hospital, perfectly cured, on the sixty-first day after the accident.*

The circulation and all the functions of the limb were gradually re-established, and the soldier walked some months subsequently without crutches. The pulsations of the popliteal artery did not reappear, and it is probable that this vessel was converted into a ligamentous cord, from the seat of the wound as far as its bifurcation into the tibial and peroneal arteries.

Case 2nd. On my way to Brussels, I had an opportunity of seeing a young English soldier, who had received a wound similar to that inflicted on the aid-de-camp Arrighi, with this difference only, that in the case of the Englishman the wound was on the left side of the face, and the external carotid was not entirely divided, as in the example of Arrighi; in the former also the haemorrhage was renewed on the removal of the first dressings. The English surgeon eagerly laid bare the primitive carotid artery, and embraced it by two ligatures applied very tightly and immediately upon the vessel. On their falling off, the edges of the wound were approximated, the cicatrix promptly formed, and the patient cured a few days afterwards. There were no pulsations in the temporal artery, and the trunk of the facial nerve having been destroyed by the ball, as in the person of Arrighi, the motive powers of the muscles of the face on this side and animal sensibility were extinct. This is the second instance, with which I am acquainted, of a wound of the carotid in man cured by the assistance of art.

Case 3d, drawn up by M. Gimelle, assistant surgeon-major to the military hospital of Gros-Caillou.

Daniel Hyppolite, sergeant in the 4th regiment of infantry of the royal guard, received, on the 9th of April 1817, a wound with a sword in the superior external and somewhat anterior part of the right thigh, three inches and a half or thereabouts below the anterior inferior spinous process of the ilium. It penetrated to the depth of

* This case was compiled by Dr. Zink, one of our most distinguished surgeons-major.

two inches and a half in a horizontal direction from without inwards and somewhat from before backwards, so as to involve, we suppose, the external and slightly posterior part of the femoral artery.

The patient lost, at the moment of the infliction of the wound, a large quantity of blood, which gushed out by jets to a distance. The haemorrhage was arrested by syncope, but again took place on the following day with the same phenomena, and was stopped with the greatest difficulty. The subject of the injury was sent, on the same day, to the hospital of the guard. He presented to us the following symptoms in our visit of the eleventh:

A tumour in the right groin, of the size of the fist, extending from the anterior inferior spinous process of the ilium to the pubis, and presenting throughout a slightly bluish colour, and pulsations isochronous with the heart; a sense of coldness in the leg and foot of the same side, and burning heat in the tumour; a hard, full, and vibrating pulse. We prescribed bleeding from the arm, (this was repeated twice in twenty-four hours,) barley-water with ice, as a drink, and a nitrated antispasmodic emulsion potion at night. The patient was laid in a horizontal posture, with the leg flexed on the thigh, and the latter on the pelvis. A cold emollient cataplasm was applied to the tumour, and the leg wrapped in warm flannel. These primary symptoms were gradually allayed, and from the third day we were enabled to add pounded ice to the above-mentioned application. The mucilaginous, sedative, and antispasmodic drinks were continued.

By these means the inflammatory symptoms were totally dissipated, the tumour diminished in size, and the pulsations concentrating themselves, were sensibly diminished every day. We substituted for the cataplasm, pure ice contained in a bladder; it was frequently renewed, and uninterruptedly continued.

The reduction of the tumour was followed by an acute pain in the knee and leg of the same side. The pulsations of the femoral artery, under the sartorius muscle, before passing the tendon of the adductor magnus, had experienced great diminution, while the arterial beat was very sensibly manifested along the course of the articular artery, at the

internal side of the knee. These phenomena led us to believe, that the crural artery was obliterated in a large portion of its extent, and that a new circulation was established by the anastomoses of the profunda femoris and arterial branches issuing from the pelvis, with those furnished by the superficial femoral below the obliteration.

The total disappearance of the aneurismal tumour, and the evident dilatation of the articular artery of the knee, confirmed our notions on this subject. These new phenomena, however, gradually disappeared, and the circulation seemed to be restored to the trunk of the injured artery, and all of its branches; for pulsations were very plainly felt along their track as far as the popliteal region, while those of the articular artery of the knee were no longer perceptible. The limb resumed its natural heat and fulness.

By these facts, I am induced to think, 1st. that the superficial femoral artery, after being pierced by the point of the sword, in its posterior and external wall, at first contracted, and caused in part a momentary suspension of the course of the blood in the trunk and its branches, thus giving rise to the primitive symptoms, of which mention has been made.

2nd. That the blood, meeting with obstacles to its escape by the small wound, either through the resistance of the aneurismal sac, and the weight of the ice applied to the tumour, or the permanent flexion of the limb, and the adhesive inflammation occurring in the edges of the wound and the surrounding cellular tissue, was forced to resume its course in the trunk of this artery, and the branches emanating from it, and from this period the wound, contracting adhesions with these parts, closed and cicatrized. The circulation, finally, was maintained and supported in the limb by the original and natural system of arteries.

The first instance of this remarkable cure occurred in the person of a surgeon-major of the navy at Brest, labouring under a wound of the axillary artery, inflicted by the point of a sword. M. Billard, surgeon-in-chief of this department, succeeded in preserving the calibre of the vessel, and the circulation in the limb, by a very ingenious method, having some relation to that adopted by Bourdelot,

with such good effect, in the case of a wound of the brachial artery. I have seen this young surgeon-major of the navy, and have, indeed, observed, that the pulsations of the wounded artery are performed to the touch like those in that of the other arm.

A young soldier of the guard has furnished us with the third example of this phenomenon. He was sent to the hospital in the course of last July, to be treated for a chronic headache, which resulted from a fall. With other remedial means, this patient was bled with the lancet in the left temporal artery. Some days after this slight operation, a circumscribed tumour of the size of a pea appeared at the point of the cicatrix, with pulsations, and all the marks of a veritable aneurism, which was progressively developed. Graduated pressure was exercised on this tumour by my direction, and enabled M. Gimelle, one of our assistants-major, to cause, in a few days, its disappearance, and with it the subsidence of the pulsations in the arterial branch, with which it was connected. We supposed, for some time, that the whole of the injured artery was obliterated, and converted into a ligamentous substance. But it was subsequently perceived, that the beat of this vessel was reproduced, and continued from and below the cicatrix to its extremity, so that it may be truly affirmed the blood again circulated through the same channels. Such is the case in a vein of the arm, for instance, in which a tumour, following a small opening made in this tube by the lancet in the operation of blood-letting, will be formed. Compression exerted on this varicose enlargement obliterates it, together with the venous branch, which is above. Its calibre, however, is soon after restored, and the circulation continues in the same vein as before the bleeding. It appears to me, then, that a sort of analogy may be established between these two kinds of spontaneous operations.

OF ANEURISMS.

PREVIOUSLY to reporting the cases of certain singular aneurisms, which we have collected, I will allow myself a short digression on the mode of exercising pressure, pursued by us in the first of these cases, being one of a wounded femoral artery. This method, which engaged the Royal Academy of Surgery towards the end of the last century, has, at the present day, become a subject of scientific discussion, and the object of the pretensions of some celebrated foreign surgeons, who attribute its discovery to themselves, while it belongs entirely to French surgery.

M. Baron Percy, indeed, one of our most celebrated academicians, assisted by M. Bugnotet, his fellow, and a pupil of the school of Alfort, made a great number of experiments on large and small animals, and, in 1788, an account of their results was given to the Academy. This illustrious society, as M. Percy has informed us, adopted by preference the mode of binding the vessel, called that by flattening or compression.

The arterial tube was frequently found obliterated at the termination of four or five days, whatever may have been the method of acting on the vessel by the ligature, and this obliteration was such, that injections, thrown with force into the artery, above or below, could not overcome or pass beyond it.

Some years subsequently, M. Deschamps, one of the most respectable members of this Academy, with the view of effecting this flattening by degrees, invented a metallic *serre-nœud*, of very ingenious construction, but of difficult application.

M. Professor Dubois, wishing to simplify the ligature, substituted for the *serre-nœud* of Deschamps one of his own contrivance, which he had frequently employed with advantage, when, in 1815, he advised me to perform the same operation on the subject of the case to be hereafter described.

In anticipation of the latter, we will give a sketch of this

method of operating. It consists in laying the femoral artery bare, and, by means of an aneurismal needle, introducing under it a band of waxed thread, or, what is preferable, a silken cord. It is sometimes necessary to cut the sartorius muscle, in order that this ligature may be passed beneath the vessel. Before the loop of the noose is tightened, a small cylinder of the plaster of *diapalme* is placed between it and the external wall of the artery. The two ends of the cord are then brought together, made to pass into the perforation of the *serre-nœud*, and attached to the small forked projection which forms its extremity.*

Doctor Assalini, one of my companions in Egypt, apprehensive of the contact of the metal with the artery, has contrived a *serre-nœud* of wood, having the form of a small barrel. But it is a matter of very little consequence, whether the instrument be wooden or metallic, provided it be separated from the artery, and this is effected by interposing a roll of plaster.

Should the latter be too soft, the ligature will reach the vessel too speedily. If, on the contrary, it be too hard, the very fragile coats of the artery will be quickly ruptured or subjected to ulceration.

Of all these means, I prefer the *serre-nœud* of Dubois, with the cylinder of plaster. Experience has taught me the superiority of the advantages of this method.

If the aneurismal tumour be very much dilated, and about to be opened, it should be apprehended that too speedy a compression would cause it to burst. In this case it is more prudent to make gradual pressure on the artery, in order to allow the blood retained in the aneurismal sac to be discharged into the inferior branches. This suddenly accomplished constriction may also be accompanied, in individuals of much sensibility and irritability, with nervous symptoms of a more or less serious character. Under such circumstances, we are of opinion, that the compression should be so graduated, that the agglutination or adhesive inflammation of the arterial parietes may not take place

* The description and form of this instrument are contained in the eighth vol. of the Memoirs of the Medical Society of Emulation.

before the eighth or ninth day. It would then also be imprudent to remove the ligature before the tenth day, since the circulation of the blood might again be established in the artery and aneurismal tumour.

When, on the contrary, the patient is endowed with little irritability, and the tumour is not much enlarged, the surgeon may, without apprehension, and at the first effort, accomplish the entire contraction of the vessel, in order to cause its obliteration and adhesive inflammation. These effects, however, cannot be obtained to a degree sufficient for guarding against the subsequent separation of the arterial parietes, before the third or fourth day. Upon this supposition, it is advisable not to take away the ligature before the fifth day.

It suffices, for the extraction of the latter, to disengage the two cords of thread, and gently draw one of them.

It is well to suffer the cylinder of plaster to remain, until it shall be expelled by the vascular process going on in the wound.

Some examples of individuals operated upon in this manner are reported, in which the ligature was removed in the first twenty-four hours, without the appearance of any mark of a new circulation in the vessel subjected to the operation.

The reduction of the aneurismal tumour is promoted by the employment of ice, pounded and contained in a bladder. In all cases, attention should be paid to the first effects of the ligature, particularly when it is tightly applied. One of the most alarming accidents, doubtless, in the existence of which I should not have believed, had I not seen it, is the retiring or congestion of the arterial and venous blood of the limb that has had its principal vessels tied. This superabundance of the sanguineous fluid takes place towards the heart and brain, and is manifested by redness of the face and eyes, acute and deeply seated pains in the head, *præternatural* beating of the carotids and temporal arteries, frequent palpitations, restraint, oppression, and great anxiety.

In the first instance, one of the jugular veins or temporal arteries, or the *vena saphena* should be quickly opened, *pediluvia* employed, ice applied to the head, the pa-

tient kept on a rigorous diet, and cooling acidulated drinks with ice, and mild antispasmodics, administered to him. This retrograde movement of the blood was particularly observed in the subject of the following case.

François Fériol, lancer of the ex-guard, aged thirty-nine years, of a strong constitution and sanguine temperament, had been labouring, for about six months, under a false, consecutive, or encysted aneurism of the popliteal artery. Having remained, without benefit, in the hospital of Orleans, and being desirous of placing himself under my care, he was induced to repair to Paris, and enter the hospital of Gros-Caillou, on the first of May, 1815. The tumour, at that time, was as large as the fist. This soldier did not recollect that he had made any exertions, or met with any fall, or received any blow, capable of producing this affection. It appeared to have been caused by the disappearance of an herpetic eruption, which covered both legs, and especially the right. This phenomenon was followed, almost immediately, by a pain in the right ham, accompanied with restraint and tumefaction throughout the knee-joint. These symptoms were augmented after a slightly forced march, which was made by this lancer during the first of December, 1814.

The pounded ice and cooling regimen, that were employed for ten days, did not impede the progress of the tumour. The large and crusty cicatrices, observed on the diseased leg, having apprized me that the eruption, which in the first instance took place, was a syphilitic herpes, I substituted an appropriate treatment, and thus reduced the aneurism one-fourth of its volume. But, as it then appeared to remain in the same state, and the impatient sufferer formally expressed his desire to be operated upon, I resolved upon performing the operation, according to the method of Hunter. Previously to its execution, I wished to consult M. Professor Dubois, who persuaded me to tighten the ligature, and gradually remove it, before the artery could be cut, and when there no longer existed any pulsations in the aneurismal sac; he assured me that this plan had perfectly succeeded in his hands, in a similar case.

I decided upon the adoption of this mode, and solicited

Doctor Ribes to assist me in the operation; it was performed on the second of June, in the following manner:

The patient being placed on the edge of his bed, I made an incision of about three inches through the integuments of the middle portion of the thigh, along the internal border of the sartorius muscle, which was soon laid bare and detached from its posterior connexions. An assistant drawing it aside, I isolated the artery, and introduced under it, at the most favourable point, a needle, made expressly for the purpose, and armed with a strong ligature consisting of a waxed threaden cord. A flattened cylinder of the plaster of *diapalme* was placed between it and the artery, in order to prevent a lesion of the vessel by the *serre-nœud*, in which I had engaged the two extremities of the ligature. The latter was gradually tightened, until the pulsations subsided, and fastened to the *serre-nœud*.

The patient bore the operation with fortitude; it was, however, neither tedious nor painful. The dressing was terminated by an appropriate apparatus, which has already been described. Most absolute repose, diet, cooling drinks, and antispasmodics were prescribed. Acute pains were at first felt about the point occupied by the ligature, and the limb was somewhat cold and numbed. Warm flannels enveloped the leg and foot. The pains gradually subsided, and, a few hours after the operation, heat was restored to the whole extremity. But at the beginning of the night, symptoms of congestion and headache were developed, which were allayed by a copious bleeding from the arm, and a nitrated anodyne emulsion. The night was spent in tranquillity, and with some moments of sleep.

Slight pulsations were observed in the aneurismal tumour, in my visit on the morning of the third. I tightened the ligature, until they entirely ceased. A few hours afterwards, the head became again violently affected, with redness of the face, injection of the vessels of the conjunctiva, and extreme beating of the carotid and temporal arteries. The pains caused by the ligature were, however, supportable, and the leg and foot preserved their natural heat and powers. The patient was bled from the arm a second time, and more blood de-

tracted than at the former period. It was repeated during the night between the third and fourth, and the same remedies continued.

By the fifth day all the symptoms, which we have pointed out, had disappeared. This is the only occasion on which I have been capable of perceiving, in so evident a manner, the effects of the reflux of the blood into the arteries.

On the removal of the first dressings, the eighth day, new pulsations were manifested in the tumour. I again exerted more force on the ligature, and the beating was entirely arrested. The suppurative process was established in the wound, and the patient was in the best possible condition, when I was obliged to absent myself the tenth day after the operation. M. Ribes had the goodness to undertake, according to my request, the tightening of the ligature, should he think it again necessary, and to assist with his advice M. Pigou, surgeon to the hospital of the first class, to whom I had confided the patient.

On the twenty-second day, the tumour having been reduced three-fourths of its volume, and the pulsations no longer occurring, these surgeons deemed it proper to remove the *serre-nœud*. But the ligatures and cylinder of plaster were suffered to remain until the twenty-seventh of June, when these foreign substances were extracted. The tumour did not pulsate, and had diminished considerably; in short every thing, indicated the obliteration of the cavity of the artery by adhesive inflammation.

Tonics and nourishing aliment were substituted for the cooling regimen, the wound promptly cicatrized, and the patient gradually became again possessed of his strength.

On my return from the country, the aneurismal tumour, reduced to the size of a walnut, no longer evinced a pulsatory action, and, a few days afterwards, this lancer left the hospital perfectly cured. The limb which had been affected was more emaciated than the other, and its muscular movements more feeble.

The circumstance which appears to us to have contributed, in the greatest measure, to this cure, is the conversion of the arterial tube into a continuous ligamentous cord. When, on the contrary, the artery is suffered to be cut by

the ligature, the patient is exposed to consecutive haemorrhagies, which are not always prevented by the division of this vessel with the bistoury, between the two cords, as M. Maunoir, of Geneva, recommends. This latter method, moreover, known to the ancients, was resorted to, about the end of the last century by the French surgeons, and especially by M. Tenon. But, it is of no avail in the example we suppose, since the principal object here is the preservation of the arterial trunk, which has been tied.

Of Varicose Aneurism.

Varicose aneurism, or aneurismal varix, is, in a measure, a rare affection, since the circumstances and causes which produce it are encountered with difficulty; thus, it appears to have been unknown to the ancients. The first well attested cases have been communicated by Guattani and Hunter.

The authors, who speak of this malady, have observed it only in the vessels at the fold of the arm. But one example can be found, in which it existed in those of the ham; it is reported by Lassus. (See his *Pathologie*, vol. 2.) I am acquainted, however, with a second instance of it, addressed to the Royal Academy of Surgery, by my uncle, M. Larrey, director of the school of medicine at Toulouse, and at that time surgeon-major of the general hospital of this city. The varicose tumour, of the size of two fists, occupied the whole of the popliteal region of a middle aged man, who had been wounded in this part by a sword, some years previously. Amputation of the thigh, acknowledged to be necessary by a consultation of surgeons, was successfully performed, and the preparation sent to the academy. On my return from North America, I had an opportunity of seeing it in the hands of M. Dubois, one of the Academicians, and remember, that the popliteal artery presented, at the bottom of the varicose sac, a pretty large aperture, ragged in three-fourths of its circumference, and continuous by a very small portion with the inferior obliterated part. The sac, thin and transparent, was evidently formed by the popliteal vein, the two extremities of which, especially the lower one, corresponding to this varicose

tumour, were very much dilated, so that the trunk of the vein formed with this pouch a kind of funnel. The popliteal nerve, flattened, and rendered thin like a ribbon, adhered to its external surface. The history of this case, which should accompany the preparation, exists, doubtless, among the archives of this academy.

A pretty large number of examples of varicose aneurisms, seated in the bend of the arm, may be found in authors. But, in reporting these cases, all, even to Scarpa, agree in asserting, that the blood which escapes from the opened artery, and penetrates into the vein through a corresponding aperture, distends it to a great degree, and forms a circumscribed tumour of more or less considerable size, the branches of the dilated vein not participating in the affection, since the valves resist, and apparently must resist, this retrograde movement. This circulation, doubtless, cannot be effected in these vessels, but in a slow and gradual manner, when the dilatation has extended successively to the branches of the varicose trunk, and their sensibility totally changed. We have observed this in two individuals.

The first was a patient, who, having received a wound in the right axilla, laboured under an aneurismal varix of the whole venous system of the arm. When the limb was abandoned to its own weight, all the veins were engorged, and the most projecting pulsated isochronously with the arteries. If the arm were raised to the head, these vessels were evacuated, and their beating entirely ceased.

The second example of this kind of varicose aneurism, was furnished me in the person of a grenadier of the ex-guard, whom I have had the honour to present to the society of the medical faculty. As we attended this soldier from the time of the accident, we can give an account of all the phenomena presented by this malady in its different stages.

Cadrieux (Pierre) aged thirty-two years, being challenged to single combat, November the twentieth, 1811, received a stroke from a sabre in the superior part of the thorax, above the left sterno-clavicular articulation. The point of the weapon, directed backwards, outwards, and downwards, at the moment when this grenadier was about to inflict a

blow on his adversary, his arm being stretched out and very much elevated, cut a part of the attachment of the sterno-mastoid muscle, the scalenus anticus, the subclavian artery very far forward, the vein of the same name, and probably also a large portion of the brachial plexus. A dreadful haemorrhage took place at that instant, and the wounded individual tottered. He walked some steps, however, towards a house contiguous to the scene of the fight. But he soon fell into a state of syncope, and lay, as though dead, in one of the apartments of this building. Pressure was exerted on the wound by assistants, the patient rendered warm, and a small quantity of good wine administered to him. The subject of the injury was, in fine, restored to life, and conveyed to the hospital of Gros-Caillou, which he entered on the night between the twentieth and twenty-first of the month above mentioned.

The patient, in my visit of the morning, exhibited all the symptoms of a speedy death. He was as cold as marble; his countenance was impressed with the pallor of death, his lips discoloured, eyes dull, and nearly closed, and his voice so much weakened, that what he articulated could not be heard, but by applying the ear to his mouth. Haemorrhage no longer took place from the wound, which was upwards of half an inch in extent. Having brought together its edges, I maintained them in this position by adhesive strips, and applied over these a compress dipped in cold camphorated wine. The clavicle of the same side was concealed by a large tumour, appearing both above and below this bone, and beating isochronously with the heart. The pulsations were more marked in the portion of the tumour below the clavicle. More deeply, and in the direction of the axillary vein, a singular rustling noise, resembling that caused by the passage of a liquid through several tortuous and metallic tubes, was also felt and heard. The arm of the injured side was cold, insensible, destitute of motion, and without pulsation in its arteries, even in the axillary. The pulse in the opposite arm was small, nervous, and scarcely sensible; respiration was, however, unembarrassed, and there existed no evidence of effusion of blood into the thorax. Notwithstanding the little hope presented in the case of this pa-

tient, whose anguish and anxiety announced his most imminent danger, I speedily caused the whole of the affected limb to be enveloped in very warm flannel, care having been previously taken to rub it with the oil of chamomile, containing a large quantity of camphor. Very warm embrocations with the same liniment were employed over the whole surface of the body. Rich broth, with a little Bordeaux wine, and, as a drink, the infusion of chamomile, were administered to him by my direction. His strength and general heat were gradually restored.

On visiting him in the evening, I found him agitated, disturbed, and labouring under some symptoms of irritative fever. The affected limb and aneurismal tumour were in the same state; but the jugular veins of the side corresponding with the injury were engorged and pulsating. I substituted for the infusion of chamomile a ptisan, made of oat meal and the *triticum repens*, acidulated with nitric alcohol, and sweetened with syrup. Two glasses of anti-spasmodic anodyne emulsion, were prescribed for the night, and a surgeon placed near the patient, in order that he might observe events.

On the morning of the twenty-second, the aneurismal tumour, without any augmentation in size, pulsated more strongly, the jugular vein of the same side was considerably dilated, and the beating of the carotids and arteries of the sound arm had also increased. The face was coloured, and the patient experienced painful and very violent pulsations in the head. I caused the vein of the right arm to be opened, and applied to the tumour thick compresses dipped in camphorated and ammoniated vinegar, containing ice; these were renewed every hour. The internal and external treatment, which I prescribed on the preceding day, was continued; nitrated chicken water being, however, added, to be taken alternately with the above mentioned ptisan. Emollient enemata were likewise ordered. I was in constant dread of more haemorrhage.

The night between the twenty-second and twenty-third was passed in disturbance. I found the vessels extremely swollen, in my visit of the latter day. Violent headache, and marks of delirium were developed, together with very violent throbbing in the jugular vessels. The pulse in the

sound arm was febrile and nervous. I opened the left jugular vein with the view of evacuating the vessels of the brain, allaying the painful pulsations experienced by the patient, and preventing apoplexy, with which he was threatened. The blood, issuing from the vein in an arched form, was red, and presented all the characters of the arterial fluid. The throbbing and pain in the head were diminished, in a great measure, by this depletion, the patient was tranquil, but constantly a stranger to sleep.

On the twenty-fourth, the same symptoms were again aggravated; I abstracted blood, the third time, from the arm. Sleeplessness and headache continued, with some variations, nearly until the ninth day. In this interval, I instituted a fourth bleeding from the arm. During this period, the applications, remedies, and regimen, which I prescribed on the first day, had been uninterruptedly employed, (a treatment recommended by Valsalva,) since the tumour and affected arm had remained nearly always in the same state. The wound made by the instrument cicatrized by the eighth day. Towards the tenth, we observed a swelling of the veins of the affected arm, which, until this time, had continued in a state of relaxation; the cephalic pulsated. Heat and sensibility were developed throughout the limb, and at the fold of the elbow. The forearm and hand were cold and destitute of sensation, and there was an absence of the pulse. The aneurismal tumour was reduced in size, and concentrated into a very small space under the clavicle, and behind the great pectoral muscle; but the rustling noise was more violent. I allowed the patient rice-cream, light soups, and Bourgogne wine, but in very small quantity. He had resumed his powers of speech, and the pulmonary functions, which had not been deranged, were performed with regularity. I made no change in the treatment.

He spent several days in this condition. The pains in the head were, however, gradually allayed, he recovered his sleep, and the imminent danger of his situation was observably removed. Heat extended, by degrees, down the arm, and reached the hand in a few days. From this period, movements were successively developed in the muscles of the arm and forearm, and with them, ani-

mal sensibility in every part. The hand remained constantly motionless, and the patient incessantly experienced in it an extremely painful pricking sensation, which narcotic liniments could not appease.

The aneurismal tumour had entirely disappeared before the twentieth day; the rustling noise, however, and the pulsations of the veins of the neck and arm, especially those of the cephalic, continued to the same degree. At this period, I suppressed the use of the cold topical applications and emulsions, the ptisan being still employed, and permitted the patient the use of light and nourishing aliment. The arm remained in this state, without losing its fulness. Heat, sensibility, and motion, were gradually restored to it, and after the fifty-fifth day, we felt very slight pulsations in the radial and ulnar arteries. The rustling noise became less sensible, and appeared to diminish, the veins became less swollen, their throbbing more feeble, and I had no doubt, that these phenomena would be more and more reduced, as the pulsations in the arteries should augment. Such was the state of the affection, under which Cadrieux was labouring, when I had the honour to present him to the Society of the Medical Faculty, at its meeting of the fifteenth of January, the fifty-sixth day after the accident.

How can we explain this spontaneous cure, and the singular circumstances presented in the different stages of the malady, which may be called varicose aneurism? Without pretending to a solution of such questions, I will attempt an explanation of some of these phenomena.

In the first place, how was the haemorrhage, which should from the nature of the case have proved fatal, spontaneously arrested to appear at no subsequent period?

1st. The syncope of the patient and change of position in the parts produced this result. Indeed, the sudden depression of the clavicle, the retraction of the artery, which was entirely divided doubtless at the point where it takes the name of axillary, and the contractile approximation of the fleshy fibres of the sterno-mastoid, scalenus anticus, and sub-clavius muscle, arrested the course of the blood.

2nd. A part of the blood was effused into the surrounding cellular tissue, so as to form, during the first

days, a fluctuating pulsating tumour. It was gradually removed by absorption, without presenting any ecchymosis on the exterior.

3d. The subclavian vein having been pierced by the sabre from below upwards, at a point corresponding to its connexion with the divided portion of the artery, a part of the blood passed into the vein, whence it flowed at first into the trunk of the sub-clavian, the jugulars and sinuses of the dura mater, thus giving rise to the symptoms of which we have spoken. The sanguineous fluid moving then into the axillary vein, and probably forcing the valves, introduced itself into its principal vessels, and circulated from part to part through all their ramifications, so as to penetrate into the organic capillary system of every portion of the limb, by which nutrition was effected. This extraordinary circulation was characterized by the engorgement of the veins of the arm, their pulsations, and the red colour of the blood, which we abstracted. As this operation, however, was carried on merely by a small part of the blood from the divided artery, transmitted into the primitive trunk of these veins, nature gradually prepared the small arterial branches, which establish the communication between the inferior thyroid, first intercostal, internal mammary, deep-seated cervical and thoracic vessels, and the articular, superior scapular, etc. arteries. Nature offers great resources in the anastomoses, which compensate entirely for the largest arterial trunks.

On my return, in August, 1815, M. Cadrieux, whom I had located in the Hospital of Invalids previously to my departure for Russia, came to the hospital of Gros-Caillou to express his thanks, and exhibit to me his affected arm. This patient, who has been presented a second time to the society of medicine, has excited our astonishment by the remarkable changes which were effected in the arterial and venous circulation of this extremity.

1st. The axillary, radial, and ulnar arteries, which pulsated sensibly towards the fifty-fifth day after the accident, presented no longer any movement whatever. Thus, contrary to our conjectures, the circulation in these vessels was annihilated; yet the nutrition and

calorification of the limb were not interrupted, and it possessed the same size as that of the opposite side. This phenomenon cannot be explained but by admitting the production of a new system of arteries; but the manner in which the latter was developed, and the blood ceased to communicate with, and circulate in, those vessels we have designated, is explicable with more difficulty. We will, however, endeavour to solve this question.

We are of opinion, that the large arterial branches, cut off from their trunk by a ligature, or some other means of interruption, receiving but a very small quantity of blood by the ordinary anastomoses of minute collateral vessels, are incapable of supporting the circulation in the limb, either in consequence of the obstacles to the entrance of the sanguine fluid into these arteries, arising from its almost retrograde movement, or because these vessels contract and react with difficulty on a mass of liquid which is not proportional to their calibre. In short, this is moreover the case, since the properties of the blood, when it passes through capillary anastomoses, doubtless experience modifications that may prove injurious to the functions of the ordinary circulation. Thus it is carried on through this passage, but very incompletely, and during a period of pretty short duration. The first arterial branches below the ligature are gradually obliterated, and nature labours incessantly for the establishment of another circulation through a new route. Other arteries, indeed, are developed, and proceed in nearly parallel directions. The primitive ramifications of this new system arise from the collateral ones furnished by the upper part of the tied artery. The last shoots or branches from these trunks, not seeking for the ordinary anastomoses, are connected with other ramuscules more or less deeply situated between the muscles and membranes of the bones. These ramuscules are developed in their turn, and, after having ramified into the interior of parts in a winding direction, and from one point to another, terminate at the extremity of the limb, or communicate by larger or smaller ramifications with the last branches of the former principal trunk. This latter is generally found obliterated from the point occupied by the ligature, to the mouths of the above mentioned branches, so that this new system of arteries arises

and terminates at a very great distance from the seat of the malady.

Such is the progress and distribution of this kind of vessels, presented by the unique and interesting preparation of Doctor Ribes. This arterial specimen, and the case which we will report, in making known the great resources of nature in the most hopeless cases, explain the success obtained by the application of a ligature to the external iliac* artery, an operation performed at London, first by Abernethy, and afterwards by Astley Cooper, and appear to us to confirm our opinion on the manner of this new circulation.

2nd. The pulsations, which were at first observed in the principal veins of the neck and affected arm, have not only ceased, but these vessels themselves, if they still exist, are no longer apparent. This extraordinary change is, doubtless, the result of that which has been effected in the arterial system.

3d. The principal fingers of the hand are deprived of motion and strongly retracted. I presume, that the primary cause of the latter is connected with the deep wound inflicted on the brachial plexus, by the same instrument that cut the subclavian artery. It is possible, also, that the hot waters of *Bourbonne-les-Bains*, which this patient used at a very high temperature, may have been the determining cause.

I proceed to report the summary of the case, which has caused us to make these reflections.

Pierre L——, aged forty-six years, of a middle stature, strong constitution, fair complexion, and a veteran in the battalion of Paris, contracted, during the first years of his military career, several syphilitic affections, which, according to his account, were treated with all possible care. In 1794, he was wounded in the right thigh by

* This operation forms the subject of a question, of which its importance does not at present permit me to treat. I will only remark, beforehand, that in nearly all of the bodies of those who had submitted to it, were found the characters of an aneurismal diathesis, viz. aneurismal tumours in other arteries, distant from that to which the ligature had been applied. Under this supposition, I will ask, of what benefit can it be?

a ball, which passed entirely through it, from the groin to the buttock of the same side, without injuring the femur, or the principal vessels of the limb. The wound, however, did not cicatrize for a long period. The patient habitually held his leg in a half-bent position, and was unable to go from one place to another, without crutches. Having one day imprudently and roughly extended the affected leg, he experienced, in the popliteal region, a very acute pain, which again necessitated his observance of a state of quietude, and a permanent and motionless flexion of the leg. Having been, for some time, a stranger to all kinds of exercise, he was desirous of attempting to walk on a wooden leg; but the knee, leg, and foot became swollen to such a degree, that he was forced to abandon it, and repair to the hospital for invalids, in order to receive there the succour which his condition required.

The following is a sketch of the description of the disease by Doctor Ribes, at that time assistant-major to this institution.

“ The patient was pale, feeble, and very much emaciated; his leg was in a semi-flexed posture, and it would have been impossible for him to extend it completely, even with great exertion. The extremity was swollen; the superficial veins of the knee and leg somewhat dilated, and nearly the whole hollow of the ham filled by an aneurismal tumour, which pulsated in a manner sensible to the eye, as well as to the touch. During the night, the patient started from his sleep in consequence of an acute burning pain, that extended from the affected part to the sole of the corresponding foot. In the day, this particular sensation disappeared, and there merely remained a stinging throughout the limb, which likewise proved very inconvenient.

“ M. Sabatier having resolved to treat the disease by refrigerants, first diminished the plethora by general bleedings, prescribed mucilaginous drinks acidulated with nitric alcohol, and applied ice to the tumour.

“ After a continuation of this treatment for fifteen days, the pains diminished, the aneurismal tumour fluctuated less sensibly, and pulsated less apparently.

"At the expiration of a month, its volume was considerably reduced, and there was also a well marked abatement in the other symptoms.

"In the second month, every thing indicated a great thickening of the parietes of the aneurismal sac together with much diminution of its size. Agreeably to this evident improvement, the patient himself continued the application of ice with uncommon perseverance.

"After the third month, the tumour, reduced to the volume of a pigeon's egg, no longer pulsated. In short, resolution being completed the fourth month, M. Sabatier permitted the patient to walk with crutches. The limb at that time was destitute of heat, considerably emaciated, and almost entirely deprived of motion. These, however, were gradually restored, as well as the circulation and nutrition."

Towards the eighth month, M. Ribes having an opportunity to present this soldier to M. Caillot, professor in the school of Strasburg, they both observed in the popliteal region merely a very small, hard, insensible, and non-pulsating tumour. The leg was not yet completely extended, and the patient could not support himself but by crutches.

A year had scarcely elapsed, when the patient perceiving, for the first time, after making a false step, that arterial pulsations were developed on the sides of the knee, became frightened, and hastened to his private physician, to consult him on this novel condition. Doctor Ribes saw, to his great surprise, that the beating appertained to the small articular vessels, which were considerably dilated. From this period, the cure of the patient was rendered sure, and may be considered as perfect; indeed, he speedily resumed his ordinary employments, and no more was seen of him.

In 1811, thirteen years after the cure, he fell into a state of melancholy, and presented successively all the symptoms of an organic disease of the heart. They progressively developed themselves, and death supervening on the twenty-first of December of the same year, terminated the painful career of this unfortunate soldier. His body was buried without examination. M. Ribes, although

he was not informed of the occurrence until fifteen days afterwards, obtained permission to have the body disinterred, in order that he might submit it to inspection. Previously to carrying his research into the limb which had been the seat of the aneurism, he was desirous of knowing what had taken place in the principal cavities.

The corpse throughout was considerably emaciated. The thorax being opened, the ventricles of the heart and trunk of the aorta were found very much dilated, and in a state of veritable aneurism. The abdominal aorta was then laid bare and injected; but the largest quantity of the matter thrown into it was arrested in the centre of the popliteal artery, the point occupied by the aneurismal tumour. M. Ribes made vain attempts to force the injection through the posterior tibial artery: he was obliged to fill separately each of the principal and new arterial branches, an operation as tedious as difficult in consequence of the putrefied state of the body. These singular vessels were dissected and prepared with unlooked for success in the hands of this skilful anatomist, and there resulted the remarkable preparation, which he presented, in the course of the year 1812, to the society of the medical faculty. I had a drawing and engraving made of this dissection with his consent. (See plate No. 2.)

I shall not give a detailed description of the preparation; the drawing, and explanations which accompany it, appear to me to suffice. I will restrict myself to observing, with my friend, that the trunk of the popliteal artery having been obliterated, nature was forced to employ all her resources for the preservation and re-establishment of the circulation in the limb, as we believe we have explained, after relating the case of Cadrieux. *See*, moreover, the *Bulletin of the Society of Medicine*, Vol. V. p. 284, et seq.

Aneurism of the Brachial Artery.

In my Memoir on the causes of spontaneous aneurisms,* I believe, I have demonstrated the possibility of a greater or less dilatation of all the arteries, which is evidently proved by M. Ribes' preparation. The developement of anastomosing vessels adds to this proof, and the most incredulous should be convinced of the truth of this assertion, by the following fact.

Léonard B——, aged twenty years, dragoon of the ex-guard, received in a duel, towards the end of September, 1811, a sabre wound in the ulnar side of the right arm. The ulnar artery was injured by the point of the instrument, and the haemorrhage arrested by very forcible compression, exercised by a handkerchief above the wound. The edges of the latter were almost immediately brought together by a surgeon, who did not disturb this ligature; some days elapsed before it was removed. The patient was cured at the expiration of twenty days. He experienced, however, some stiffness in the fold of the arm, and a dull pain at the bottom of this part. A small tumour, of an ovoid form, which in some months had already acquired the size of the fist, was soon developed. At this period the dragoon entered our hospital.

The tumour made a projection in the triangular space formed by the supinator longus, pronator teres and fold of the arm. It beat isochronously with the pulse of the same side, this being much smaller than that of the left arm, and was characterized by all the other marks of aneurism.

The disease having reached its third degree, could not be treated with advantage, but by an operation. This I performed in the presence of the physicians of the hospital, Doctor Ribes, and several surgeons-major of the corps of the guard.

In the first place, I exposed the brachial artery by an incision parallel to this vessel, and, separating it from the median nerve and cellular tissue, with my flexible needle,

* See Tome II. of this work.

applied the ligature, placing on its interior a cylinder of plaster. Having then laid bare the aneurismal sac, I opened it, and found its cavity filled with fibrous clots of blood, which it was somewhat difficult to detach. I cleansed the whole cyst, and searched in vain for the two extremities of the artery, supposing, at first, that it had been divided by the sabre. A more minute examination convinced us, that it was in the first instance dilated, since the parieties of the upper portion of the artery were continued in a funnel shape into the sac, and we observed, at its posterior part, the orifice in the common interosseous artery, from which a pretty considerable hæmorrhage took place. A ligature below became necessary, in order to embrace this vessel. The aneurismal sac terminated in the ulnar artery, which we found obliterated above the point where it appeared to us to have been injured; this was about an inch from the tumour. The obstruction dispensed with a third ligature.

The operation was happily concluded in less than twenty-five minutes. I applied over the wound, the edges of which were approximated by adhesive plaster, pledgets of charpee, and a very moderately tight bandage. The patient was placed on a diet, and the use of cooling and antispasmodic articles. Slight disturbance manifested itself during the first twenty-four hours; all the symptoms, however, were dissipated by a febrile action, which supervened on the third day, and was accompanied by abundant perspiration, and a purulent discharge from the wound. The pulse reappeared at the same time, but remained feeble and small for several days. I removed the first dressings, which had already imbibed the purulent serosity. The edges of the wound were a little swollen, and light cellular sloughs existed in its interior. Balsamic substances were applied to it, and the dressing was effected with method, and with all possible simplicity. The same care was continued until the ninth day, when the principal ligature, around the brachial artery, came away with the cylinder of plaster. This did not occur with the second ligature, until the eleventh day. In short, the wound speedily assumed a healthy condition, its edges were gradually brought together and cicatrization completed in less than six months.

All the motions of the arm were restored, as I had bestowed much attention on the muscles, essentially necessary to the utility of the limb.

Here two questions are naturally presented:

1st. Why did the pulse immediately re-appear, although the principal artery had been tied?

2nd. Why, as M. Maunoir of Geneva has said, was not the artery cut below the ligature?

In answering the former interrogatory, I will remark, that I have reason to believe the collateral vessels of the brachial and recurrent radial, and ulnar arteries had already become very much dilated previously to the operation, since the course of the blood was interrupted in the inferior part of the aneurismal sac, by the obliteration of the trunk of the ulnar vessel, in which the aneurism was seated. These anastomoses compensated for the circulation in the brachial artery, tied above its bifurcation.

My response to the second question is, that the whole of the artery comprised between the two ligatures was mortified, being removed in its whole extent on the ninth day, and that the two ends of the artery remaining sound, were found obliterated. This result proves the artery not to be ruptured, as some celebrated practitioners have pretended, except by a violent mechanical cause. Nature must establish an inflammatory process, in order to effect this division. But it is more advantageous, as we have already remarked, to prevent the artery from being cut, as well by interposing a body between it and the ligature, as by the flattening of its tube, caused by graduated and exact compression, with but a circle of thread.

MEMOIR

ON

THE BENEFICIAL EFFECTS OF THE ACTUAL CAUTERY, AND
ESPECIALLY ON THOSE OF THE MOXA, IN THE TREATMENT
OF RACHIALGIA, FEMORO-COXALGIA, ETC.

A MALADY of the most serious nature, and one that is considered in its effects to be fatal, by almost all physicians, is that rheumatic or scrofulous affection, which attacks the joints of individuals subjected to one of these morbid conditions. This is particularly the case with that which is seated in the spine, and is designated by the terms *disease of the vertebrae*, *curvature of the spine*, or malady of Pott. Notwithstanding the remarks and interesting observations, whieh the English surgeon has made on this affection, its existence is not ordinarily perceived until it has reaehed its second or third degree, at whieh period, art offers fewer resources, than when put in requisition from the time of the invasion of the first symptoms.

Until the time of Pott, surgeons had but vague and uncertain notions with regard to diseases of the spine. The effect has been often confounded with the cause, and even at the present time, celebrated authors and practitioners consider abscesses by eongestion, whieh constantly result from earies of the vertebrae, as a malady separated from, and independent of that of the spine.

The researches I have made, for thirty years, in camps and military hospitals, have enabled me to verify the principles of the celebrated English physician, and to analyse, with the greatest detail, the phenomena presented by this disease in its different stages.

My numerous experiments, have also made me acquainted with a sovereign remedy for this cruel affection, in the repeated application of the moxa, whieh is the prineipal subject of the present memoir.

In the first place, I have thought it necessary to change the improper terms, under which the morbid condition that now occupies our attention has been designated to this day, and to substitute for them names which will make known its true character. As it consists in latent inflammation of the organic vessels in the fibro-cartilaginous and osseous tissues of the vertebræ, or bony pieces of other parts of the body, I will call it according to its seat; viz.

Rachialgia, when it attacks the spine;

Sacro-coxalgia, when located in the sacro-iliac symphyses;

Costalgia, if it involve the ribs, or their cartilages;

Scapulalgia, if the scapula, (shoulder-blade;)

Femoro-coxalgia, if the hip-joint;

Humero-scapulalgia, when the disease is established in the articulation of the shoulder, etc.

I designate by the term *rachialgia*, that rheumatic or scrofulous affection, which is seated in a part of the vertebral column, and has for its principal effect the production of a chronic inflammation in the fibro-cartilaginous and osseous tissues of the vertebræ. This inflammation, instead of augmenting by engorgement the volume of the parts, diminishes their density, and appears to accelerate the work of absorption and decomposition, so that the bodies of the vertebræ, in which this change is effected, becoming soft, gradually sink; the spinous processes have a tendency to separate from each other, and project backwards, or incline to the right or left. By these phenomena is gibbosity or a relative depression characterized. The inter-vertebral cartilages are first decomposed or absorbed, and this extensive absorption is soon succeeded by erosion or caries in the corresponding points of the bone, in which it is developed with more or less rapidity, according to the intensity of the causes, and the age and idiosyncrasy of the patient. Caries rarely attack the spinous or transverse apophyses. From the first period of this erosion, there is discharged from all the injured vessels an ichorous and purulent fluid, which is at first arrested under the membranes or surrounding ligamentous fibres, is then infiltrated or effused into the cellular passages, towards depending points, or those where it meets with the least resistance,

and accumulates in more or less remote situations, producing there what is termed a symptomatic abscess, or an abscess by congestion. These purulent collections, as the English author has judiciously observed, constantly result from caries* or constitute one of its principal effects. The progress of these abscesses varies to infinity. They are most generally seated in the dorsal or scapular regions; the matter spreads through the interstices of the muscles, tendinous attachments, and transverse processes, and accumulates in sacs formed by the aponeuroses, or large muscles of the back. Sometimes the pus passes under the pillars of the diaphragm, follows the course of the psoas muscle behind the peritoneum, and collects in the groin, or passes through the pelvis, and reaches the buttocks. In other cases, it pursues the direction of the ribs posteriorly to the pleura, and accumulates in one of the most anterior points of the thorax. Nothing can be more singular than the progress of these purulent collections, and the development of the abscesses which result from them. This circumstance should render the practitioner very circumspect in his prognosis, as well as in the employment of the means to be put in requisition.

The first symptoms which mark this affection, are deeply seated local pains of a pretty obscure character. They afterwards augment, and spread in the course of the spinal marrow and nerves emanating from it, especially those which are distributed to the limbs most contiguous to the seat of the alteration. The muscles of these parts become numb, without being paralysed. These members experience painful cramps, and a kind of stiffness or accidental retraction, with a sensation of cold independent of the temperature of the air. To these symptoms are added pain, oppression, loss of appetite, emaciation, and slow fever, with more or less irregular intermissions, followed by colliquative diarrhoea and marasmus.

We will enter into the greatest details on the progress of this malady, when speaking of femoro-coxalgia, a similar affection attacking the hip-joint, and will only remark

* See the works of Percival Pott, Tome III.

here, that the cauteries used by Pott, in rachialgia, do not possess the advantages which we derive from the moxa. The abundant suppuration produced by the former, without causing the desirable revulsion, debilitates the patient considerably, particularly if symptomatic abscesses or abscesses by congestion already exist. Should the latter be opened at an early period, whatsoever may have been the plan pursued previously to employing efficacious remedies, in the treatment of the caries, the patient very speedily dies. But in the administration of these means, care should be taken not to suffer these foci of suppuration to be established. It suffices to excite an irritation about the affected parts, in order to divert the morbid principle, and change the vital properties of those that are inflamed. The moxa, preceded by cups and scarifications, if there be reason for their application, perfectly fulfils this twofold indication. Its specific properties have been mentioned in the article *Moxa* in the *Dictionnaire des Sciences Médi-cales*. We will at present content ourselves with pointing out the causes of the malady of Pott, and making known our manner of treating abscesses by congestion, which constitute its principal effect.

The causes of rachialgia are, a rheumatic or scrofulous disposition, and, generally, every thing which may contribute to annihilate the vital forces of the vertebræ. This affection is developed, and progresses slowly, but is rarely arrested in its course and spontaneously cured. It is one of those maladies, of which nature cannot rid herself without the assistance of art; thus, its consequences are ordinarily fatal. The most appropriate means, then, for combating this affection should be speedily employed, and experience has shown to us, that the moxa is the most powerful and efficacious. By this remedy the caries is arrested, the portions of bone, attacked by it, caused to cicatrize, and the osseous vessels elongated, and brought into a state of contiguity, in order to effect this interior cicatrization. The vertebral column then becomes shortened, in consequence of the loss of substance in the bones which compose it. The hard and soft parts of the trunk undergo a relative reduction and approximation, and all the tissues harmonize, both as to their relations and functions, with

this deficiency of vertebral matter. The gibbosity, or curvature, is at this time obliterated, the vertebrae insert themselves, as it were, into each other, and have a mutual tendency to approach, as may be observed in plate third, taken from a pathological preparation appertaining to a subject of one of the cases, which are connected with this article. This phenomenon was again seen, in a very evident manner, in several other individuals concerned in the following cases, and especially in the person of Pierre Moussot, whose vertebral column was shortened about an inch and a half. In the cabinet of pathological anatomy, attached to the hospital of London, there is the spine of a patient, four of whose dorsal vertebrae have been entirely destroyed in their bodies, and their osseous portions been made to cicatrize by the cauteries, which Pott himself applied, to the back of the individual, during the malady. He was cured, and died, a long time subsequent, of a different affection. I received this information from Mr. John Cooper, father of the celebrated English surgeon of this name. The principles, which will be successively developed in the course of this memoir, will be fully justified by these facts; it is merely important that time should not be lost in making use of the moxa.

Many, whose situations were thought desperate, have been indebted for their preservation, to this measure. We will first report the summary of several cases which confirm this truth, and will then have occasion to return to the theory of this affection.

Case 1st. M. de L_____, exhausted by many debilitating causes, particularly by the toils of war, was attacked with a dorsal consumption, accompanied by a slow fever, remarkable asthenia of the genital organs, nocturnal emissions of semen, slight curvature of the spine, pain and numbness in the lower extremities, and marasmus of the first degree. This affection had resisted many remedies. It was decided, in consultation, that a series of moxæ should be applied along the vertebral column and region of the sacrum, the bark and ferruginous preparations being continued. Favourable changes were effected by the first three applications, and the strength of the patient restored as they were repeated. The general could walk

alone after the seventh application, and after the thirteenth was enabled to go to mineral springs, in order to complete his cure, to which he had already very far advanced. He has since made several campaigns.

Case 2nd. Mademoiselle D——, aged about twenty-five years, was in the last degree of marasmus, labouring also under well marked symptoms of phthisis pulmonalis. The dorsal vertebræ were already curved backwards and to the right; the scapula of the same side was separated about an inch from the trunk by a soft tumour or deposit and commencing congestion, which indicated the first degree of caries of the vertebræ; in short, she bordered, as it were, on the confines of her career, when I was called to bestow my services upon her.

The debilitating diet, to which the patient had been subjected for several months, was superseded by a tonic and nourishing regimen. Bark, in combination with opium and balsamic and gummy substances, was prescribed. Twenty moxæ were applied successively, at intervals of from three to four days, on the sides of the spinous processes of the dorsal vertebræ opposite the spaces which separate the transverse apophyses. The first favourable change was the almost sudden cessation of the symptoms of phthisis pulmonalis, soon followed by the reduction of the dorsal vertebræ, their approximation, the resolution of the sub-scapular tumour, and sinking of the scapula. The general strength of the patient was gradually restored, and the internal organs resumed the play of their functions; in fine, this lady now enjoys good health.

I am at present going to give an account of a malady nearly similar to the preceding. The case is that of one of our patients in the military hospital of Gros-Caillou.

Case 3rd. Joseph Richaulet, aged twenty-three years, a cannoneer of the guard, entered the hospital in February, 1816, labouring under a tumour of the size of two fists, and of an oval form, situated behind the spine of the right scapula, and extending from the base of this projection below the inferior angle of the bone. The tumour fluctuated throughout its whole extent, without the existence of pain or change of colour in the skin. The patient kept him-

self constantly in a bent posture. The spinous processes of the dorsal vertebræ were salient and separated, and this portion of the spine had deviated somewhat to the left, the side opposite the seat of the tumour. When a slight pressure was made on the points corresponding to these vertebræ, the patient experienced acute pain, accompanied by a sensation of weakness, which amounted to syncope, if the compression were continued. The tumour, and other symptoms connected with it, caused me to recognize, without difficulty, the malady of Pott in its second and even third degree, resulting from a rheumatic affection, which this soldier had contracted in the cold and humid bivouacs in France during the campaign of 1814.

The state of the patient was so desperate, that I looked for no success from the employment of the moxæ; however, I had recourse to them. After the third of these applications, made at an interval of two or three days, along the course of the dorsal vertebræ, which appeared to be the most affected, Richaulet found himself relieved, and the tumour was sensibly diminished. At this period I had a drawing made of it. (See plate No. 4.)

I prescribed antiscorbutics, and the continuation of the moxæ, until the twenty-fourth had been applied. The latter were employed on the centre of the purulent sac, for the purpose of facilitating the union of its wall with the deeply seated parts. This soldier was completely restored to health, by the twenty-third of July, of the same year. (See the same plate.) I have since learned, that he lost during the course of his disease about six lines of his height.*

In Tome II. page 396. *et seq.*, of the Recital of my Campaigns, there will be found some cases, which verify the happy effects, resulting from the employment of the moxæ, in rachialgia or dorsal consumption, attended by caries and abscesses by congestion, which are its consequences.

* He has been several times presented to the Society of the Medical Faculty.

Having used the moxa until the end of the progress of the disease, I operated on the abscesses in some of these cases, according to the method explained in the above mentioned work. It consists in making an oblique opening in the abscess, by means of a small knife at a white heat, and then at the same instant, causing an evacuation of all the purulent matter accumulated in the part, by dry cups, and a slightly compressive bandage.

The following case, and those which are reported in our second volume, pointing out this method in its greatest detail, will, I think, justify the rules I have established.

Case 4th. Pierre Moussot, aged twenty-four years, of a bilio-phlegmatic temperament, a fusileer in the sixth regiment of the royal-guard, contracted in the very humid and cold bivouacs of the campaign in Saxony, towards the end of the year 1813, a rheumatic affection, which was seated in the back. A good regimen, and the rest enjoyed by this soldier at his home, whither he had retired, allayed the primary symptoms; there scarcely remained a dull pain in the same portion of the dorsal region. During the winter of 1815, the symptoms of this rachialgic and rheumatic affection were renewed with more violence, and in the first part of May, 1816, the subject of it was conveyed to the hospital of Gros-Caillou. A considerable tumour was at that time seated between the spine and posterior edge of the scapula. I recognized, on the first examination, the malady of Pott, which had nearly reached its third degree, and was characterized by gibbosity, the inclination of the spine towards the left side, an abscess and paralysis of the bladder and lower extremities.

The tumour, resembling that of plate No. four, of an oval form, was about four inches in its greatest diameter, and projected to nearly as great an extent; its fluctuation was uniform throughout, and the skin presented no change in its colour.

I commenced the treatment by the application of dry cups, and cups over scarified parts, along the whole course of the vertebral column; these were succeeded by moxae, and the internal use of the tonics indicated.

A sensible improvement resulted from the first applications, and gradually continued. The tumour, however,

which experienced a very marked diminution after the fourth, but a less evident one, as far as the twenty-first application of the moxa, remained stationary, until the twenty-fifth of July, when a small phlyctena appeared almost suddenly in the centre of its surface, and announced to me the spontaneous and very speedy opening of the abscess. Under this conviction, I hastily plunged into it a narrow-bladed knife, at a white heat, so as to make an incision of about two inches in extent, commencing at the phlyctena, and extending towards the lower part of the tumour. A vessel, of the capacity of an English quart measure, was soon filled with a serous inodorous matter, of a greyish white, and mixed with albuminous flakes. A cup applied to the aperture completed the discharge of the small quantity of fluid remaining in the bottom of the cavity.

The patient was extremely debilitated by this operation for four days; we, however, employed nothing internally, but mucilaginous substances. Febrile action was then manifested by repeated rigours, followed by intense heat, and a sense of painful constriction in the hypochondria, with dyspncea, slight colic, diarrhoea and tenesmus; the tongue was villous, and of a reddish purple; the urine scanty and dark coloured.

There is every reason to believe, that the escape or metastasis of the very acrid principle in the pus, furnished by the caries of the bodies of the vertebræ, to all the mucous membranes, gave rise in them to a chronic inflammation, which was the source of the symptoms just mentioned.

The application of cups with scarifications, and large blisters upon the thorax and abdomen, and the administration of internal remedies, removed the imminent danger of the patient. In fine, for the promotion of adhesion between the parietes of the purulent sac, I caused moxæ to be again applied.

The recovery of this fusileer may be considered as having been very nearly completed by the twenty-fifth of November, 1816. He walked pretty easily, but was deprived of the power of bending his trunk forwards and laterally, in consequence of the union between the bones primitively affected by caries; his height was lessened by sixteen lines. It is evident, that in this patient the ulceration of the carti-

lages and bodies of the vertebræ must have been very extensive, since there was so great a loss of substance.

Another mode would be still more advantageous, if the fluid of the abscess be effused into a part of the cellular tissue, which communicates deeply through this passage with the purulent collection. It consists in carrying a seton through this cellular tissue; the fluid will immediately issue from the wounds caused by the seton, and continue to flow gradually, until entirely evacuated. Then, if the caries of the bones, which furnished this fluid, be arrested, as is supposed in this case, the complete cure of the disease will be rendered more sure, as the matter of the abscess shall have been removed gradually, and without any communication of the external air with the purulent collection. Two patients, operated upon in this manner, have been treated in the hospital of Gros-Caillou, and the result of the plan will be hereafter described.

Case 5th. Dulard, cuirassier of the royal guard, having been exposed to the pernicious influence of the cold bivouacs in Russia, was attacked by a pain in the lumbar region, with considerable numbness, and very marked debility of the lower extremities, which, at a late period, became almost completely paralysed. The physicians of *Bourbonne-les-Bains*, to which this soldier had been sent, looked upon and treated it, but fruitlessly, as a paralytic affection.

When he was taken to our hospital, I recognized, from the symptoms already frequently pointed out, a strongly pronounced rachialgia. The first three lumbar vertebræ formed a gibbosity, that projected about an inch. The slightest pressure on the diseased point caused acute pains, as well as feeble convulsive movements in the lower limbs. From the first applications of cups, which were made and repeated during a period of from five to six days over the whole spine, the hypochondria, sides, buttocks, and thighs, the relief was so evident, as to allow me to commence the employment of the moxa, and to substitute for the cooling substances, given until this time, tonics administered with the modifications relative to the indications.

Fourteen moxæ, applied successively to the sides of the projection, and towards the dorsal and sacral regions, caused

a total disappearance of the gibbosity. These, in connexion with the cups and scarifications, restored the contractile power of the extensor muscles of the inferior extremities, particularly affected with paralysis, and facilitated walking, as well as the play of all the functions, so that by the twentieth of November, the patient was advancing to a cure, and a very short time afterwards left the hospital perfectly cured.*

Case 6th. Blaise L——, aged twenty-eight years, soldier in the first regiment of infantry of the royal guard, already debilitated by the effects of onanism, began to feel, about six months since, pains in his back and pelvis.

When transferred, September the seventh, 1816, from the military hospital of Val-de-Grace, in which he had remained about six months, to that of Gros-Caillou, he presented, in the left inguinal region, an abscess by congestion, of an oval form, and as large as the double fist, manifestly fluctuating in its whole extent, and unaccompanied by a change of colour in the skin. (*See plate No. 5.*) One of its most projecting parts was already about to be opened. The tumour was, moreover, attended by pains in the hip, the thigh of the same side, and the dorsal region.

An evident gibbosity, jutting out about three-quarters of an inch, and formed by the separation of the spinous processes of the last dorsal vertebræ, proved that the surgeons at the hospital of Val-de-Grace had not recognized the primitive lesion, of which the abscess was merely a symptom, since this tumour arose in a carious point seated in the bodies of some of the dorsal or first lumbar vertebræ. Cups with scarifications along the whole extent of the dorsal region, and especially on the sides of the gibbosity, combated the chronic inflammation, and afforded considerable relief to the patient.

After the application of thirteen moxæ, the tumour, which had diminished somewhat in size, remaining stationary, and the point already alluded to again appearing ready to be opened, I lost no time in carrying a seton

* This soldier was also presented to the Academy of Medicine, at the period of his cure, half a year after his entrance into the hospital.

through the integuments and cellular tissue of the groin of the same side. Care was taken to comprise in the perforation the deep cells of this region, with which the purulent matter of the sac appeared to me to communicate. In causing the evacuation of the whole of the fluid, in a gradual manner, I was desirous of avoiding a direct opening into the tumour, in consequence of the softness and moderate thickness of its parietes, as well as of its very great contiguity to the abdominal viscera.*

Notwithstanding, however, the very marked reduction of this abscess by congestion, its walls were so much wasted, as to cause apprehensions of their spontaneous rupture. On this account, I resolved upon plunging in it a knife, in a state of incandescence, according to the method above described.

During the first three months after the operation, the patient was as well as could be desired in his situation. The pus, though secreted abundantly, was of good quality; the symptoms of fever from absorption were dissipated, all the functions executed in a healthy manner, and L— commenced walking in the hall.

This unfortunate individual, accustomed to the use of spirituous liquors, employed them in excess from the moment of the removal of his danger, and his progress to a cure. A very few days after this intemperate indulgence, he was, in consequence, attacked with violent colic and ardor urinæ, and afterwards fell into a state of stupor. The suppurative process in the wound, which remained fistulous, was suppressed, and an absorption of purulent matter, taking place towards the lungs and brain, almost immediately manifested itself. The functions of these organs were gradually disturbed and weakened, and, after a month of suffering, the patient died in a state of marasmus and exhaustion.

Twenty-four hours after his death, we proceeded to the inspection of the body, which was already of a livid hue. The limbs were supple, and very flexible. No-

* I have remarked, that these abscesses, or the purulent collections which produce them, never divide serous membranes.

thing remarkable was observed in the viscera of the abdomen and thorax. The head was not examined; but we had reason to suspect a purulent condition of the brain from the paralysis of all the muscles of the extremities before death, and from the symptoms of headache and mental aberration, which were also developed previously to the total extinction of life.

Having removed the abdominal viscera, we discovered, as I asserted the instant the patient entered the hospital, a purulent collection, extending from the fistulous wound in the iliac region along the psoas muscle, and behind the peritoneum, as far as the bodies of the second and third lumbar vertebræ. At this latter point, there was a loss of substance, from seven to eight lines in extent, formed at the expense of these two vertebræ. The other portions of the bones had approximated, and become mutually adherent. The hollow, resulting from the deficiency of substance, was filled up by a very thin and vascular fibrous or membranous tissue, which united the two osseous fragments, and was confounded above and below the cicatrix with the exterior ligamentous covering. The form of this pathological preparation may be seen in the drawing, No. 3. It proves, in an unexceptionable manner, that caries of the vertebræ, howsoever extensive it may be, can be arrested, and the parts perforated by the ulceration made to cicatrize, as is the case in venereal caries of the cranium, when methodically treated.

I have attended three soldiers, of different grades, who, in consequence of chronic syphilis, laboured under caries of several parts of the bones of the cranium. It had furrowed, to a greater or less extent, the whole substance of the external table and diploe of the frontal bone, reaching into the sinuses, with great loss of substance, in the one,—had hollowed out the same bone, and the two ossa parietalia, in the second, and the frontal and occipital, in the third. All three at present enjoy perfect health. The loss of substance, or hollows, arising from the caries, are perceptible to the eye or touch, under the integuments, which have contracted adhesions in all points. From seventy to eighty mercurial frictions on the soles of the feet, and at long intervals, were employed in each of these three cases; but

mercury does not arrest the progress of rheumatic or scrofulous caries, but appears, on the contrary, to aggravate it. Several examples have demonstrated to me the truth of this assertion.

It is evident, that the caries had been arrested in the case of Labaudre; that the fragments of bone affected by this disease had cicatrized and united, and that there merely remained for the complete recovery of the patient, as it occurred in the subjects of the preceding cases, the assumption of a healthy condition by the seat of suppuration, the fluid of which had disorganized the cellular tissue of the psoas muscle and iliac region, where the abscess was pronounced. This fact proves, in short, that these maladies are curable, when the surgeon has courage to persist with perseverance in the employment of the moxa, and when, on opening the abscesses which result from the caries, care is taken to remove, at the first effort, all the matter contained in the cyst.

Of Sacro-Coxalgia.

RHEUMATISM may exert its effects on the sacro-iliac symphyses in such a manner as to produce, in young persons particularly, a gradual disjunction of the two bones, and, consequently, a kind of spontaneous luxation. This is the only articulation, in the osseous system, in which such a species of displacement can be effected. Still it is true, that this dislocation is generally caused by mechanical violence, such as falls, or strong compression exercised in a direction inversely to the line of relation between the two bones.

The case communicated to the academy of surgery, towards the conclusion of the eighteenth century, by M. Lhéritier, professor in the Practical School, is a striking example of this affection. The subject of these observations was a young agriculturist, who, having for a long time laboured under a rheumatic pain in the right sacro-iliac region, suffered, in consequence of a fall, a disjunction of the two bones which form this symphysis, in such a manner as to allow the ilium to move alternately from above downwards and conversely, with the greatest facility. M. Lhéritier, after having employed the actual cautery, imagined the ingenious plan of fixing the two bones in relative apposition, by means of an elastic bandage, the form and composition of which may be seen in the drawing that has been made of it, and must be contained in the archives of the Faculty of Medicine in Paris.

I have since seen this kind of displacement suddenly effected in young soldiers, by spent balls acting obliquely on the ilium, from above downwards. I could report here, in detail, the case of an individual, who laboured under a like affection, and was treated under my inspection a pretty long time in the military hospital of Gros-Caillou.

In this disease, the corresponding lower extremity experiences an unnatural elongation, proportional to the sinking of the ilium, if the displacement of this bone take place from above downwards. In the contrary case, this limb presents an equally unnatural shortening relative to the elevation of the os innominatum.

Should the malady be recent, it may be remedied by the means employed by Lheritier, to which may be added with advantage, the reiterated application of the moxa.

If the affection, however, be of long standing, with union of the bones in their vicious situation, it is incurable. But it frequently happens that it produces, in the sacro-iliac symphyses, a carious process analogous to that which takes place in the vertebræ, as we have seen in rachialgia, and will perceive in femoro-coxalgia.

The diagnosis of this particular lesion is established with difficulty. The surgeon, however, may assure himself of its existence, when the local pains, habitually felt by the patient, are augmented by immediate pressure on the sacro-iliac region, and when there is present in this part a manifest tumefaction.

The remedies indicated in rachialgia should then be employed in this affection, which is of the same nature. But I cannot speak in too strong terms against the application of the moxæ to the portions of skin that immediately cover the bony projections; consequently, it is necessary to select the space corresponding to the affected symphyses.

The same disease sometimes also affects the ribs or scapulæ, as we have observed in several instances. The result of it, when seated in one or more of these bones, is entirely the same as in the preceding cases. It may be equally affirmed, that the abscesses, which are manifested at points more or less contiguous to the seat of the disease, are constantly produced by caries in these bones. The abscesses here do not differ, as regards their nature and developement, from those which accompany rachialgia properly so called. To the two former affections may be given the names of costalgia and scapulalgia.

In all cases of these maladies, we have remarked, as in rachialgia, that when the abscess is opened, either spontaneously or by art, before the caries of the bone, which produced it, is arrested by the means that have been pointed out by us, the issue is fatal. But, when the moxa is employed at an early period, so as to put a stop to the carious process, the operation indicated for these abscesses is followed by fortunate results. We have seen several examples to this effect.

Of Femoro-coxalgia.

I thus designate the latent or chronic inflammation, which is seated in the fibro-osseous tissue of the hip-joint, resembling that of which mention has just been made as attacking the vertebræ, or other bones of the trunk. This inflammation is ordinarily the effect of rheumatism, serofula, or exhaustion of the powers of the individual.

Femoro-coxalgia may be hereditary or acquired. The former is necessarily the case, when the disease arises from a serofulous taint, as is observed in children.

Under this supposition, the means which I am about to make known for the treatment of rheumatic femoro-coxalgia, an affection always occurring accidentally, are generally indicated with very little modification in serofulous coxalgia. The symptoms, moreover, that accompany this malady in children, are the same as those of rheumatic femoro-coxalgia in adults exposed to the causes which produce and give rise to a developement of the rheumatic affection. I shall confine myself, then, to the description of the latter, reserving some reflections on the effects of serofulous femoro-coxalgia.

Femoro-coxalgia, of a rheumatic nature, rarely attacks persons of extreme age. It is ordinarily manifested from the first period of puberty to the commencement of manhood, viz. at that time of life when the work of ossification is about to terminate. The disease is developed with a facility and promptness proportional to the exposure of the individual to a number of vicissitudes, which act on the fibrous or ligamentous system. Young soldiers, subjected to laborious marches, engaged in long campaigns, and doomed to pass through cold countries, are more obnoxious to it than others. This I particularly observed after the long and tedious campaign in Russia.

The disease in the greater part of the young military being very far advanced, and in the first instance not recognized, resulted in an unhappy manner; I was so for-

tunate, however, as to treat several with unlooked for success. Previously to reporting these cases, I will briefly describe the symptoms of femoro-coxalgia. It is announced by pains more or less deeply seated in the joint, which soon spread along the femur to the articulation of the knee. At this latter point they concentrate themselves, so as to divert the attention of the patient and physician from the true seat of the disease, seated in the hip-joint, and thus lead to error. The patient habitually carries his thigh and leg half-flexed, and the movements of the limb, especially those of complete extension and flexion, are executed with difficulty. The nutrition of the member is promptly altered.

In the first stage, the extremity is gradually elongated, and passes beyond the level of the other. This unnatural lengthening is owing to the state of relaxation and paralysis of the muscles surrounding the articulation, as well as of the ligaments, especially that which fixes the head of the femur in the bottom of the cotyloid cavity. It is on the insertion and substance of this ligament that rheumatism particularly exercises its primary effects. During this first period of the morbid process, the pains are deeply seated, the patient experiences general uneasiness, and the functions of organic life are more or less disturbed, according to the irritability of the patient; a febrile action is established, with intermissions proportional to the duration of the paroxysms. These phenomena may be explained by the stagnation of the fluids in which the joint is bathed, and by the inflammatory and atonic state of the capsular ligament, synovial membrane, and articulating portions of the bones. The cartilages do not force out the head of the femur, as several authors have described, (*See Tome 15, page 33, of the Dictionnaire des Sciences Medicales,*) for I have constantly found them, on examination, to be dissolved, or rather thin than swollen.

By this state of general alteration in the articulating parts, the head of the femur is gradually removed from the bottom of the acetabulum. An elongation of the limb is thus caused, and is the more evident as the inter-articular ligament shall have lost its elasticity, or been detached

from its insertion either into the cotyloid cavity or head of the os femoris, a circumstance of very early occurrence. Indeed, when this fibrous band is disconnected from one of the points of its insertion, the femur, in consequence of its curvatures and gravity tending to a straight line, must give rise to an elongation of the limb so much the greater, as the parts which concur in maintaining it in its relations with the os innominatum have lost their spring.

But is the head of the femur entirely displaced, as the same authors have advanced? or, if this be not the case, what happens to it?

Previously to its reaching the edge of the cotyloid cavity, the erosion of the interarticular ligament and diarthrodial cartilages takes place, and a spontaneous luxation does not occur, unless caused by a fall or forced movement of the thigh capable of dislocating the articulating extremity of the femur, already deprived of its ligament of insertion. This circumstance will promptly give rise to a displacement. Moreover, if on examining the body the head of the luxated bone be found external to its cavity, the essential cause of it should be referred to a fall, or violent blow, which operated on the extremity of the bone, so as to produce a primitive or consecutive dislocation. Femoro-coxalgia may have preceded or followed this affection, and such, I think, was the case with the individuals mentioned by my illustrious preceptor Sabatier. (*See the Memoirs of the Royal Academy of Surgery.*)

When the luxation exists in connexion with the malady under consideration, it presents, together with the symptoms pathognomonic of femoro-coxalgia, those that characterize the dislocation; with the latter I have never met in the large number of patients, whom I have treated. But the internal eroding process is accompanied by a serous lymphatic discharge, which fills the cotyloid cavity, and contributes doubtless to the displacement of the head of the femur. The dimensions of the latter are reduced by caries, which attacks its surface, invades at the same time the whole of the articulating cavity, sometimes perforating it at its thinnest points, extends gradually into the os innominatum, and penetrates into the pelvis. In this situation, the fluid at first accumulated in the joint,

frequently and suddenly forms purulent collections, while at other times it separates the fibres of the capsular ligament, infiltrates itself between the neighbouring muscles, and gives rise to one or several abscesses in parts more or less contiguous to its source. From this period the symptoms become more intense; the limb may even experience a momentary shortening, in consequence of the head of the femur wasting from caries, or the sudden escape of fluid from the articulating cavity; the second stage is thus characterized. Surgeons have been in this way led to believe in the existence of a spontaneous luxation. But on examining with attention the straightness and conformation of the limb, no signs are discovered which undeniably characterize the dislocation, and I repeat, that the head of the femur, moreover already reduced by the caries, is not displaced, except by a concomitant mechanical cause. I have never seen a solitary instance of it, although I have had occasion to inspect the bodies of a large number of persons who died of femoro-coxalgia.

The third stage is characterized by the progress of the caries, the developement of abscesses on the exterior, at points more or less distant from the seat of the disease, and the febrile and cachectic condition of the patient. These abscesses are nearly circumscribed, and fluctuate uniformly in all parts of their surface, without local pains, or change of colour in the skin. The purulent collections extending slowly and insensibly, and having reached their third degree, their parietes are rendered thin, and, in the end, spontaneously ruptured. From this moment the patient falls into a state of gradual colliquative fever, the ulcerated parts become gangrenous, and death ensues. On examining the body, collections of pus are found about the articulation, and the destruction of the bones by caries observed.

Such is the progress of this malady, which I have followed in a large proportion of individuals. When it does not exceed the first or second stage, it is susceptible of a cure, particularly if the patient be removed from the action of the causes which produced it. I have seen many such instances, and several of them are reported in this work. Others, of a nature no less interesting, will be pointed out. But should the disease have reached its third stage, it is

more difficult to arrest its progress, and obtain the recovery of the patient; the remedies indicated must, however, be employed in an equal degree. We now proceed to make known these remedies, and their mode of application.

In the first stage, it is requisite to divert the inflammation from the articulating parts, by local revulsive bleedings, as by means of cups with scarifications applied repeatedly around the joint. By this operation, opportunely performed, the vessels of the articular ligaments are successively emptied, the pain diminishes, and the patient experiences manifest relief. Should the inflammatory symptoms continue, or should they recur during the course of the disease, as happened in some of my patients, a seton must be passed in the fold of the thigh through the integuments, and cellular tissue, without disturbing the muscles, or any of the crural nerves and vessels. I had recourse to this plan, with advantage, in one of the cases which are connected with this memoir. The moxa afterwards produces more beneficial effects.

Quibus à diuturno coxendicis dolore femoris caput suo loco excidit, iis crus tabescit, et claudicant, nisi urantur. Hipp. ap. 60, sect. 9. ed. Bosquillon.

Doctor Correff, one of the most learned physicians of Germany, had the kindness to inform me at the time of his coming to Paris, in the commencement of the year 1816, that Professor Rust, of Vienna, at present connected with the university of Berlin, employed with much benefit, and without any preparation, a red hot iron, which he applied upon the articulation in three oblique lines, united at the great trochanter. He has invented a cautery for this express purpose, the form and thickness of which, enable it to preserve, during the whole application, the quantity of caloric necessary for effecting the desired cauterization at once, and without the necessity of again placing the iron in the fire. It has been observed by him, that the limb, immediately after this operation, suddenly resumes its natural length, and becomes level with that of the opposite side. I have had occasion to verify this remarkable phenomenon in four cases, which will be hereafter reported; in these it was produced, as the German professor asserts.

This phenomenon, I think, may be explained in the following manner. In the first place, I attribute, as has been said, the elongation of the limb to a very great relaxation, or rupture of the interarticular ligament at one of its insertions, as well as to the paralysed condition of the surrounding muscles. Now the application of the actual cautery to the region of the joint, causes instantly a simultaneous and almost tetanic contraction of these muscles, and restores to the weakened ligaments their elasticity and spring, necessary for maintaining the head of the femur temporarily in the cotyloid cavity, into which this bony eminence is suddenly drawn up by the artificial contraction. The assertion heretofore made, relative to the rupture of the interarticular ligament is confirmed by the circumstance, that, if the patient, who supposes himself cured, because his limbs have resumed their level, takes more or less violent exercise, which is apt to reproduce rheumatism in the muscles, and consequently that kind of paralysis succeeding it, the limb is again lengthened almost at one effort, and continues so for a longer shorter or period, should not the action of the muscles, and elasticity of the ligaments be restored by new excitants. These principles are confirmed by one of the cases to be reported. The sudden shortening, effected by the application of the cautery, proves, without reply, that there is no luxation.

May it now be said, that the application of the actual cautery, is necessary or useless? Without presuming yet to pronounce on this question, which experience alone must ultimately solve, and, although this is a frightful remedy, I think it may greatly contribute to the success of the moxa. The latter, not acting with the same energy, does not arrest so promptly the progress of the malady, and, I believe, great advantages may be derived from the employment of the incandescent iron. The application of cups, when they are indicated by the painful or inflammatory state of the parts, ought also to precede the metallic cautery. The former, as I have said, are generally to be employed in rachialgia.

The moxæ should be applied around the articulation, one by one, or two by two, if the strength and courage of the

patient permit. It is requisite to suffer one or several days to intervene, according to the effects obtained, and the state of the atmosphere. Foggy or moist and cold weather is less appropriate for this purpose, than that which is dry and fair.

In the first stage of the disease, it is easy to conceive how the means just pointed out may arrest its progress, and re-establish the vital powers of the affected parts. In the first instance, the cups, of which we have spoken, by evacuating the engorged vessels of the fibrous and synovial membranes, promote the circulation of the fluids in these vessels, and restore the suspended functions of the lymphatics. In short, the effects of irritation and inflammation are gradually allayed.

Hippocrates himself, recommends the use of cups in what he calls disease of the hip, as is proved by the following passage from his work, *de Locis in Homine*: *Quum coxendicum morbus à fluxione fiat, cucurbitam medicam afluxere oportet.*

After the cups, the moxæ at each application divert the internal irritation, and the caloric imparted by them to the most deeply seated parts augments their spring, and re-establishes their primitive condition.

Second stage. Should the caries have commenced with a purulent collection, the moxa must be speedily applied. For, although the disease be very far advanced, this remedy is not less efficacious, and we have had recourse to it at this period with the greatest success. Practitioners should be thus encouraged to adopt and persevere in its use.

This stage of the malady is characterized, as we have remarked, by a greater elongation of the limb, and restraint in its movements. If the purulent matter accumulated in the articulation have not yet perforated the ligamentous capsule, the external part of this region is tumefied, and painful to the touch. But, if the purulent fluid have escaped from the cavity of the joint, the limb may be proportionally shortened, and abscesses are manifested at points more or less distant from, or contiguous to, the seat of caries.

Cups are almost always indicated in this stage; the treatment, however, should be commenced with the moxa.

The greatest caution must be exercised in the applications of the actual cautery, in order that the walls of the abscess may not be divided, if it be near the joint. In this case an opening made in it would cause a communication between the external air and the purulent collection, whence serious symptoms would result, especially were the carious process not arrested, as I have already observed. The violent, but gradual excitation communicated by the moxa to the diseased parts, arrests the morbid work, and appears to increase the action of the absorbents, so that the fluids, already accumulated in the abscesses around the articulation, or in those which are remote from it, (provided they are not too much distended,) are taken up and transmitted into the mass of the circulation. I am ignorant of the ways by which the absorption of this matter is accomplished; but I think it is by the cellular tissue and venous system. It is moreover indicated by the diminution of the tumour, a pustular eruption* over the whole surface of the individual's body, and the earthy purulent sediment in the urine, which is constantly precipitated by rest to the bottom of the vessel.†

The portions of the bone affected with caries or ulceration, may cicatrize spontaneously, and actually do cicatrize, a depression being left in the soft parts, like that which succeeds an ulcer. This is proportional to the loss of substance, and a developement of the osseous vessels takes place towards the centre, which tends to promote cicatrization. When the bones that are in contact in the joint are destroyed by caries, the limb remains shortened with deformity and lameness.

Whatever may be the effects of femoro-coxalgia, nature

* It is known, that a cutaneous eruption, analogous to flea-bites, frequently marks the termination of rheumatism.

† In the Memoirs of the Royal Academy of Sciences, there is a case of a young person, who was completely cured of a gibbosity, after a fever of ten days duration, and several purulent discharges from the bowels.

very rarely unites the articulating bones. They always preserve movements more or less unconfined, which are promoted by the smooth polish acquired by them at their points of contact, the diarthrodial cartilages not being reproduced. In short, the osseous surfaces are completely solidified, the ligamentous parts which remained sound are thickened, and become dense, and the disease is cured.

Third stage. When the caries is very extensive, and the abscesses are large and near the seat of disease, art offers fewer resources. I have seen, however, some cases of recovery from this affection in its third degree, and the means pointed out for its second stage should, in all instances, be employed. But the opening of the abscesses, or the discharge of the fluid collections which result, should not be decided upon until the surgeon is convinced that hopes of their resolution can no longer be entertained, and until the source of the matter which forms them is exhausted, a proof that the carious process is arrested. This is judged of by the cessation of local pain, its absence when the diseased limb is moved, by the return of nutrition, by the strength and embonpoint of the individual, and particularly when the abscess, although it is not augmented in size, is about to be opened spontaneously.

Should the surgeon be so fortunate as to arrive at this result by the repeated application of the moxa, the internal use of antiscorbutics and tonics, which supposes a treatment of six or eight months duration, the operation appropriate to this kind of abscesses may be attempted according to the method described in my Campaigns, page 399, Vol. II. and laid down in the course of this work. It having been performed in this manner, thick compresses, dipped in warm camphorated oil of chamomile, and confined by a slightly compressive bandage, are applied to the external wall of the abscess, which has been entirely evacuated.

I think this mode is preferable to that which has hitherto been adopted, and which consists in merely making a puncture by means of a trochar or narrow-bladed bistoury, at the top of the tumour, and suffering the matter to flow gradually and very slowly. For, according to this mode

of making an opening in the abscess, the contact of the external air quickly alters the fluids, which remain in the seat of disease; the parts become gangrenous, and death speedily ensues. By my plan, I succeed in diminishing the internal infection and contagion, by evacuating with cups the whole of the fluid contained in the sac; the parietes of the abscess then unite, and are enabled to contract mutual adhesions. In fine, nature aided by all these means will more successfully resist morbid causes.

During the dressings, which must be frequently renewed, care should be taken to keep the walls of the sac constantly approximated, and prevent the introduction of air into the wound.

Serofulous femoro-coxalgia in children, as I have already observed, does not sensibly differ in its symptoms from that which I have just described. In them, as in adults labouring under rheumatic coxalgia, the luxation of the femur can be accomplished only by a mechanical cause operating during the course of the disease. I have had occasion to treat several children affected with it, and my remarks on this subject are the same as those made in the cases of our young soldiers; it has been observed by me, merely, that it progresses with more rapidity in children, and that its termination is more speedily fatal. The internal remedies which are used, such as antiscorbutics, in connexion with medicines counteracting scrofula, do not even arrest its march, whereas the moxa applied according to the prescribed rule, produces wonderful effects, and constantly destroys the disease when not very far advanced. I could cite several examples for the support of this assertion.

To these reflections I will add, that the actual cautery, justly extolled by the German professor in rheumatic femoro-coxalgia of adults, does not appear to me proper in the scrofulous coxalgia of very young individuals. This powerful and deep cauterization will bring on a destruction in the soft parts, so much the greater as they are through the effect of age, and the disease in a mucous state, a circumstance that will speedily give rise to local putridity. The surgeon should confine himself to the applica-

tion of small moxæ,* with the precautions indicated, and to the use of the depuratory antiscorbutics,† which aid these topical measures.

For the support of the principles established in this inquiry, relating to the rheumatic femoro-coxalgia of adults, I will report a series of cases, which appear to me to be possessed of true interest.

Case 1st. Madame De St. M——, aged twenty-one years, of extreme sensibility, was troubled for a long period with violent pains in the left iliac region, towards the hip-joint and knee of the same side; they were frequently accompanied by singular neuralgia, the cause of which was not recognized by several physicians of Paris.

Doctor Correff, already quoted, had me called in at the period when this interesting lady was near perishing from the effects of a tetanic constriction of the pharynx and œsophagus, which had existed for several days. I quickly forced a passage to the stomach, by means of an œsophagus tube, and caused this primitive manœuvre to be succeeded by cups and scarifications. The nervous and inflammatory symptoms were entirely dissipated the third day.

From this time I drew my attention to the cause of the very varied nervous symptoms often experienced by the patient, and recognized from the symptoms, which indicate and characterize the disease, rheumatic femoro-coxalgia in its second degree. An ovoid tumour, slightly projecting, and fluctuating evidently at its bottom, manifested itself above the crural arch, and below the anterior spine of the *os ilium*.

* M. Klaproth the younger presented me, on his return from a voyage to China, with a moxa of the form and size of an ordinary drawing pencil, which I have employed with the greatest advantage in all cases where the cotton cylinder may be applied. These small moxæ are composed of a phosphorescent wood and *lycopodium clavatum* pulverized. They are easily imitated.

† These remedies consist of a syrup, constituted by equal parts of that of Cuisinier, and one of an antiscorbutic nature, to be used in the morning by the spoonful, in a bitter infusion, a ptisan made of madder, the cross-spired barley of the brewers, and hops, and of treacle in Bordeaux wine, to be taken by the patient before going to sleep.

The inflammation, which seemed still to exist, yielded to the application of cups over scarified points; the moxæ succeeded them. The first seven or eight of the latter produced a favourable change. I combated the acute pains that prevailed, by carrying a seton under the integuments below the crista of the ilium, and continued its use for fifteen days. The moxa was again employed around the whole of the joint, and, after the application of the thirteenth, the iliacal tumour entirely disappeared. This lady had laboured under a pretty abundant leucorrhœa, which was several times renewed.

The affected leg, which was at first about an inch and a half longer than the other, was considerably retracted, and, though half-flexed, presented a shortening of about an inch. A cure was finally effected after the application of twenty moxæ.

Now, how can we account for the progress of nature to a termination of this disease, as happy as extraordinary? This is doubtless very difficult; but I think, that by applying to the subject of this case, the principles of the hypothesis established in the course of my work, it will be evident, that there was an absorption of the purulent matter accumulated in the abscess already formed in the pelvis behind the cotyloid cavity, which had probably been perforated by caries. This occurred in one of the individuals who was destroyed by the same affection in the hospital of Gros-Caillou, and who would also have been cured, had he, like Madame de St. M——, and several others, rigorously observed the regimen prescribed for him. But at the moment when well founded hopes of his recovery were entertained, the patient gave himself up to all kinds of intemperance, particularly to onanism, from which he could not wean himself, and therefore succumbed. On examining his body, I found the cartilage of the acetabulum destroyed, and the circumference and bottom of this cavity wasted by caries, while on its exterior surface was already observed the work of cicatrization, like that seen in the healing of soft parts. The head of the femur had also lost its cartilage and round ligament, and was reduced to half its size, in consequence of the caries, which had been succeeded by veritable cicatrization. The marks of a consider-

able abscess were also perceived in the interior of the pelvis, with thickening of the portions of periosteum corresponding to the seat of disease. This pathological preparation,* which I have in my possession, has been exhibited to the society of the medical faculty in Paris. I have given a similar one to Professor Rust, of Berlin.

A third specimen of this kind has been presented to the same society by MM. Beclarc and Cloquet, being taken from the body of a man aged forty years. The vertebral column of this individual was also altered, and he laboured under femoro-coxalgia and rachialgia. (See *the Bulletin of the Society*, No. 7, 1816.)

But since nature aided by art succeeded, in the subject of our case, in arresting the progress of this malady in its third degree, and effecting its cure, *a fortiori*, should not that of Madame de St. M—— in whom the affection, indeed, was much less advanced, be believed in, though more complicated by the different symptoms which were produced by, or accompanied, it? The leg of this lady was also shortened by the caries of the articulating bones, and internal cicatrization, with the re-establishment, in a great measure, of the movements of the extremity and all its functions, took place. She is slightly lame, but at present enjoys good health.

Case 2nd. This case is still more remarkable in consequence of the grievousness of the disease, and its mode of termination. Its subject was a young lady, named Constance D——, of a scrofulous constitution, and rickety by inheritance. This youthful individual, whom we attended during the course of her malady, experienced at the commencement of her adolescence, and a very short time after vaccination, pretty acute pains in the right hip-joint and the left elbow, accompanied by symptoms indicating an engorgement of the abdominal viscera, and a verminous affection. Divers means were employed, by which these symptoms were gradually dissipated. But the pains in the articulation increased; the leg became longer than that of the left side; its movements were by degrees debilitated, and it was

* See plate No. 3.

retracted on the thigh, and the latter soon drawn up on the pelvis, so that the limb could not be brought to its natural straightness. The patient and her parents were not willing to suffer any application to be made during this first stage, and the disease in consequence progressively augmented. A soft, ovoid, fluctuating tumour, without pain or change of colour in the skin, manifested itself a very little time afterwards behind the trochanter, and towards the middle of the buttock. It gradually increased; a slow symptomatic fever developed itself, and the abscess, after having passed through its ordinary stages, opened spontaneously. According to the account received from the parents, about a quart of greyish pus mixed with thick white flocculi, issued from it.

This spontaneous rupture was followed by alarming symptoms and extreme emaciation, and the death of the patient was looked for every moment; but she withstood the symptoms which succeeded. I was finally called in a little time after this melancholy epoch in her malady; it was in the year 1810.

The stiffness and permanent flexion of the affected extremity scarcely permitted me to place it in relation with that of the opposite side, with the view of knowing the difference between them. The former was half an inch shorter than the latter. Several physicians, who saw this young patient before and after the opening of the abscess, affirmed, that there was a spontaneous luxation, and that the head of the femur having escaped from its cavity, there remained nothing more to be done. All the patients of this kind, who have reached the third stage of the disease, are thus condemned to perish. I asserted that there was no dislocation, and having deduced all the reasons above explained, made a very simple experiment, which furnished a pathognomonic sign of the true nature of the affection. It consisted in causing the femur, bent on the pelvis, to execute rotatory movements on this latter part. It is then very easily perceived, that these motions are made without any resistance, since the articular ligament is destroyed. They could not take place, should luxation exist. The intro-

duction of a probe into the wound disclosed to me an extensive caries in the articulating bones, and confirmed me in my decision.

Not forgetting the local affection, I prescribed antiscorbutics in conjunction with bark or opium, according to circumstances, and liniments made with the alcoholic tincture of cantharides, containing a large quantity of camphor. Fine linen, spread with storax, was placed on the wounds, and compresses of flannel over the whole of the limb. I ordered, besides, a nourishing and tonic regimen.

The condition of the patient soon sensibly improved, and the same treatment, suitably modified according to the indications which presented themselves, was continued for the space of a year.

During this period, several purulent collections were formed at points more or less distant from the articulation. Their evacuation was facilitated, according to my advice, by means of caustic potash, which was applied to the most fluctuating parts of the abscesses. Several small pieces of bone issued from the primitive fistulous wound. The suppurative process, in those which resulted from the opening of the abscesses, gradually improved, and, instead of the fatal termination that was expected, the little patient resumed her strength, and her digestive functions, deranged by an habitual diarrhoea, were by degrees restored.

For the frictions with the tincture of cantharides, I substituted the application of a series of moxa in the intervals separating the fistulous wounds, and over the whole of the hip-joint. The patient finding herself better five or six months subsequently, the moxa was discontinued, and the irritating liniment before mentioned again resorted to. The same dressings were kept up, and the depuratory antiscorbutics continued, as had been done until that period.

On the fourth of August, 1817, when I again saw this young lady (about sixteen years of age) for the first time since my departure for the army in 1812, I found all the ulcers cicatrized, the limb perfectly straight, but shortened about four inches and a half, the trochanter in the line of relation with the knee, much more elevated than the other, and the foot one third smaller than that of the opposite side.

This shortening cannot be accounted for but by attributing it to the complete destruction of the head of the femur by caries, and to the remarkable enlargement of the acetebulum. These two portions of bone then underwent the process of cicatrization, whence resulted the polishing of both at their points of contact. The small stump, formed by the extremity of the neck of the femur, probably bore a relative position with the superior wall of the cotyloid cavity, which was deeply excavated by caries. It resulted from this happy *effort of nature*, that the thigh executed movements on the pelvis in all directions. This young individual walks without crutches, by the assistance of an iron prop four inches and a half in height, adapted to her shoe. With the exception of an approximation to deformity, the treatment, in which I was greatly aided by nature, has been followed with complete success. The slight developement of the affected leg may be attributed to the circumstance of the limb, attacked by caries at a period when it had not acquired its highest degree of nutrition, ceasing to grow like that of the opposite side. This consideration, the truth of which is incontestible, according to the small size of the foot, renders complete the cause of the excessive shortening of the member that had been diseased.

This malady apparently offered in this lady all the marks of a spontaneous luxation ; but it did not take place any more than in the subjects of the other cases. The recent death of a young man, who laboured under this affection, and was in the hospital of Gros-Caillou for eighteen months, suffering also from a very large abscess in the abdomen, by which all treatment was rendered useless, furnished me with an opportunity of verifying the exactness of my assertion. He presented, while living, the same phenomena as those observed in the person of Miss Constance D——. All my pupils expected, from the deformity and very great shortening of the limb, to find a complete luxation. The examination disclosed to us, on the contrary, the total destruction of the head of the femur by caries, and the consumption of the circumference and bottom of the acetabulum extending even into the pelvis, where the abdominal abscess arose, as I asserted previously to the death of the patient.

Case 3d. A grenadier of cavalry, aged about twenty-two years, entered the hospital of Gros-Caillou in December, 1814, presenting all the marks of the second stage of femoro-coxalgia in the right thigh, accompanied with an abscess by congestion in the external and anterior part of the hip-joint of the same side. This tumour moreover projected an inch, and was about three inches in length. (See plate 5. fig. 1.) The affected extremity, which could scarcely execute the slightest movements, when placed in a line parallel to that of the opposite side, exceeded its level about one inch. Every thing indicated, besides, a spontaneous luxation, if its characteristic signs, of which I have already spoken, and with which I never met in any of these patients, be excepted.

The application of several cups over scarified parts preceded the moxæ, and the latter gave no hopes of resolution, until the fifth one was employed. But after the application of the eighth and ninth, the tumour was reduced one-fourth of its size. New moxæ caused it to diminish more and more, when, being obliged to leave the patient, I confided him to the care of Doctor Pigou, who continuing the same treatment succeeded in curing him almost without deformity or lameness, for the limb was but from six to seven lines shorter than that of the opposite side.

Case 4th. In October, 1814, I had occasion again to witness femoro-coxalgia, in its second stage, in the person of M. Ronsan, (Jean Casimer,) aged thirty-two years, one of the king's body-guard. It resulted from a rheumatic affection contracted in the humid and cold bivouacs of his campaigns.

The diseased limb, about an inch longer than the other, was in a state of atrophy, and almost entirely destitute of motion. An ovoid tumour manifested itself in the buttock, and fluctuated obscurely in its centre. Other symptoms appeared to indicate a spontaneous dislocation of the femur, so that the head of this bone was arrested on an exterior point of the acetabulum ; but none of the pathognomonic signs of the luxation existed to confirm this suspicion.

It is useless to repeat, for the reasons above explained in describing femoro-coxalgia, that I caused cups to be applied

over scarified parts around the whole of the articulation. An improvement had already been effected by the moxa, when Professor Rust, on his way through Paris to Berlin, advised me to apply the iron at a red heat along the track of the joint, as a remedy proper for the immediate restoration of the member to its natural length. In order that I might trust to this result, it was my duty both to see and perform this operation.

Three deep lines, converging below, were marked out with the actual cautery on the posterior part of the articulation. The limb, immediately after this cauterization, lost, indeed, to my great surprise, the excess in its length.

After fifteen days of quiet, the pains in the knee were renewed, and the extremity again elongated about half an inch. I had, however, cauterized the parts pretty deeply, and in accordance with the views of the German professor. The moxa, to which I thought it then requisite to return, and which I continued until its twenty-first application, dissipated the pains and elongation, restored the movements of the extremity, and completed, in February 1816, the cure of this body-guard, whose limb only remained half an inch shorter than that of the opposite side.

Case 5th. The horse and artillery men being particularly exposed in the bivouacs, and consequently much more obnoxious to rheumatism, were more frequently the subjects of femoro-coxalgia.

Dubois, (Jacques,) cannoneer, aged twenty-five years, entered Gros-Caillou, in February, 1816. The acute and constant pains in his right knee, the flexion of his leg, difficulty of motion, tumefaction around the hip-joint, emaciation, continual slow fever, an ovoid deeply seated tumour, with obscure fluctuation at the internal side of the articulation, or its external and posterior part, according to the position of the patient, sufficiently indicated femoro-coxalgia. The affected limb was a full inch and a half longer than its fellow, and when left to itself, instantly assumed its primitive posture. At first sight it was asserted, that a spontaneous luxation was about to take place; my prognosis was, however, entirely contrary.

After the employment of cups, four moxæ allayed the

pains in a great measure; but the tumefaction of the thigh and its elongation were nearly the same. As in the preceding case, I resolved upon having recourse to the red iron, according to the method of Professor Rust. It produced an effect as speedy, and as happy; the affected member experienced a shortening of an inch and a half. Its elongation commencing again a very few days subsequently, the continuation of the moxa arrested the morbid process, maintained the limb in its shortened state, and led, in some months, to the recovery of the patient.

Case 6th. Malo (Jean-Claude,) aged twenty-three years, horse-cannoneer of the artillery of the royal guard, presented himself to my observation, in June, 1818, labouring under femoro-coxalgia in its second degree, the consequence of rheumatism contracted in the damp and cold bivouacs in Saxony. The symptoms, which characterized this malady, appeared to announce so strongly a veritable displacement of the head of the femur from its articulating cavity, and towards one of the exterior points of the edge of the latter, that several surgeons could not be persuaded to the contrary, until they saw me practise the exploratory and curative method of Professor Rust, which again proved equally successful. The limb suddenly lost the unnatural elongation which it had previously to the operation. The application of cups upon scarified parts, and an appropriate regimen, preceded this treatment.

The example furnished by the subjects of the two preceding cases, of the tendency of the affected extremity to become again lengthened, notwithstanding the cauterization, rendered reasonable my suspicions, that this phenomenon would again take place. Fifteen days after the operation, the limb became again elongated, and I was obliged to apply fifteen moxæ, in order to obtain the shortening of the member, which may be considered a certain symptom of a cure.

After a treatment of three months continuance, Malo was progressing towards a perfect recovery.

In consequence of a long run, about the time he first began to exercise, he was suddenly attacked with new inflammatory symptoms, which, in the first twenty-four hours, reproduced all the phenomena that were observed at the time

of his entrance into the hospital. In this relapse, it is evident that the chronic inflammation of the ligaments of the diseased articulation gave rise to the latter, since the repeated application of several cups over scarified parts of the joint sufficed for the removal of the principal symptoms.

The ancients did not recommend, without reason, perfect rest in the treatment of diseases of the joints. Whatever, moreover, may be the apparent good resulting from the means employed, patients labouring under femoro-coxalgia should not be permitted to walk before the entire restoration of the vital properties of the affected parts. This supposes the return of the elasticity and spring of the ligaments, the cessation of the paralytic relaxation of the muscles surrounding the articulation, and, in fine, the cicatrization of internal ulcers, which have exerted their effects either on the articulating surfaces, or fibrous apparatus. This result cannot be obtained before five, six, or seven months of treatment.

When the inflammatory symptoms resist the reiterated and energetic action of cups and scarifications, a seton should be passed through the integuments and cellular tissue of the part most contiguous to the joint, as was done in one of the above mentioned cases. The passage of the seton is accompanied with a greater or less effusion of blood, by which part after part is emptied, and successively the vessels of the articulation. The inflammatory process and suppuration produced by this foreign body in the integuments, contribute to the resolution of incipient abscesses, and to the cure of the malady. We employed this remedy in Malo's case with these advantages, and, after the operation, he experienced such an improvement that he supposed himself cured. I, however, judged it necessary to use the moxa again, and persisted in its application, until the perfect recovery of the patient, which was manifested by the cessation of the symptoms, and shortening of the limb.

Case 7th. Raboullard (Jacques), aged twenty-one years, a soldier in the second regiment of cuirassiers of the royal guard, was thrown, about three years since, from the top of a carriage into a ditch. The wheel having turned upon

him, he remained for five hours lying on his right side, and plunged in the ice. Violent pains in the hip-joint, knee, and lumbar region of the same side were suddenly developed. After the accident, the right inferior extremity was elongated about an inch. The pains, at one time calmed, at another renewed by the circumstances in which this young man was situated, constantly continued, however, with more or less intensity.

The condition of the patient at the time of his coming to our hospital, in August, 1816, presented marks of femoro-coxalgia; the lengthening of the limb had considerably augmented.

Cups and scarifications, which I caused to be employed successively about the joint, evacuated the vessels and produced a salutary effect. Three lines were then marked out by the actual cautery on the region of the articulation. When they had cicatrized, we commenced the employment of the moxa, which was continued until its eleventh application. At this period, all the symptoms of the disease having disappeared, and the limb being shortened even beyond the level of its fellow, this cuirassier rejoined his regiment perfectly cured before the end of the fifth month from the day of his entrance into the hospital.

Of Humero-scapulalgia.

RHEUMATISM or scrofula may be seated in the shoulder-joint, and produce the same effects in it, as when established in the articulation at the hip. The limb, similarly to the latter case, is in the first stage elongated, and its movements confined, difficult, and accompanied with pain. The diarthrodial cartilages are first changed, and from this moment there take place a purulent transudation and collection of fluid in the articular capsule, which is more or less distended, according to the age and constitution of the individual; but it is at last opened, the fluid escapes and forms sinuses and abscesses by congestion. The limb is then a little shortened, its painful and motionless state increases, and caries is developed in the substance of the articulating bones, pursuing the march which we have already made known.

The prognosis is relative, and the treatment does not differ from that indicated in femoro-coxalgia.

This malady may, moreover, equally attack the other articulations of the limbs, in which it constantly causes the same results. The treatment must consequently be the same, except some modifications having reference to each joint. We hope to be able, at a more opportune season, to compose a more extensive work on this disease, which may be designated by the generic term of an *arthritic, rheumatic, or scrofulous affection*, according to its cause.

Of the Amputation of the Arm at the Shoulder-joint.

WE will terminate this paragraph with some reflections on amputation of the arm at its scapular articulation.

These observations, which we communicated to the Institute on our return from Russia, confirm and develope the principles thrown out in the memoir relating to this operation, inserted in our *Surgical Narrative of the army in Egypt*. But as their principal object is to make known the mode of operating demonstrated to us by experience to be the best and exclusively adopted in our practice, we will describe it with all possible care.

In the first place, I suppose the operation to be indispensable, and every thing prepared for its execution.

The patient being seated at a suitable height, I commence the operation by a longitudinal incision, beginning at the edge of the acromion and descending about an inch below the level of the neck of the humerus. By this act, I cut through the integuments, and divide the fibres of the deltoid muscle into two equal parts. Causing then the skin of the arm to be drawn towards the shoulder by an assistant, I form two flaps, an anterior and posterior one, by two oblique cuts, from within outwards and downwards, so that the tendons of the pectoralis major and latissimus dorsi are comprised in each section. No apprehension is to be entertained as to injuring the axillary vessels, since they are out of the reach of the point of the instrument. The cellular adhesions of the two flaps are then divided and raised up by an assistant, who at the same time stops the cut circumflex arteries, and the whole shoulder-joint is laid bare. By a third circular incision around the neck of the humerus, the capsule and articular tendons are divided; the head of the bone is drawn a little outwards, and the knife is passed to its posterior part, in order to complete the section of the tendinous and ligamentous attachments on this side. The assistant immediately directs the first fingers of his two hands to the brachial plexus, in order to compress the artery and render himself master of the blood. The cutting edge of the knife is, in

fine, turned backwards, and the bundle of the axillary vessels divided on a level with the inferior angles of the two flaps, and in front of the assistant's fingers. The patient does not lose a drop of blood, and, the pressure being continued, the extremity of the axillary artery is easily discovered; it is then seized with a pair of dissecting forceps, in order that a ligature may be immediately thrown around it. The circumflex vessels merely remain to be tied, and the operation is terminated.

The wound having been cleansed, the flaps are approximated, and maintained in contact by means of two or three adhesive straps, moderately tight, and the whole stump covered with fine linen dipped in some tonic liquid, such as warm wine. The dressing is concluded by the application of charpee or fine tow over the linen, with simple quadrilateral compresses, and an appropriate bandage.

Inflammatory swelling soon after supervenes, and passes without difficulty through its stages; suppuration is established with facility from the fifth to the sixth day; the bottom of the wound puts on a healthy character, and the ligatures ordinarily come away before the tenth day. Cicatrization commences from the circumference to the centre, from the seventeenth to the twentieth, and then progresses with rapidity, being completed commonly from the thirty-fifth to the fortieth day. The cicatrix presents itself in the form of a line parallel to the course of the anterior edge of the scapula. This method is applicable in nearly all the cases that occur in armies:

1st. Because gunshot wounds in general, which disorganize or mutilate the arm so as to necessitate extirpation of this member, partly or entirely destroy the central part of the shoulder, as its most projecting portion, while there always remains a sufficiency of soft parts on the sides to form two flaps.

2nd. Because in the very rare cases of the destruction of these lateral portions and preservation of a middle part, nothing will be gained by forming out of it a flap according to the method of Lafaye or his imitators, as this flap is disorganized, in consequence of its separation and distance from the parts with which it should contract adhe-

sions, and the small number of vessels it receives for its nourishment. Even in this instance, I divide this middle part, and give to the two flaps the form they would have if entire. I have again remarked, that extirpation of the arm without flaps is followed by a better cure than when these are preserved with an unnatural arrangement. Thus, for example, in cases of total loss of the flesh at the shoulder, I have seen surgeons-major cover the scapula with a flap formed from the soft parts of the axillary region of the arm, under the intimate persuasion that it would unite with the subjacent parts, and supply the place of superior or lateral flaps. We conceive beforehand what becomes of this part; it is disorganized; consecutive hæmorrhagies take place, and the gangrene extends by infection to every part of the wound, and causes the death of the patient. Such was the fate of two individuals operated upon according to this plan in the last campaigns. My services here proved unavailing at the period of my being called in.

I will cite, as remarkable instances of the success of this operation performed without flaps, Generals Fugieres, d'Aboville, and several officers and soldiers, whose cases are reported in my Campaigns.

At Troyes, in Champagne, I had occasion to operate on a soldier of the train of artillery. The case relating to this amputation has been drawn up and presented to the Society of the School of Medicine by M. Carteron, a physician of that city and witness of the operation.

In extirpating this soldier's arm, which a ball of large size had entirely disorganized, at the same time shattering the scapula, I extracted two-thirds and a half of the latter bone, and the humeral extremity of the clavicle. The details of the case may be seen in the Bulletin of this Academy.

Another instance, entirely similar, was presented at the capture of Smolensk in Russia; I performed the same operation and with like success. From the report which was addressed to me by M. Bachelet, surgeon-major of the hospitals of this place, I learned that the patient had been removed towards Poland, the wound having completely cicatrized. I still have hopes of again seeing the soldier,

who was the subject of the first case; he has a pension at his home in Burgundy.

How is the success obtained by us from this extirpation, according to the method which we have just described, to be explained? Such success, indeed, that of an hundred, and some operations of this kind performed by us in the different armies or in Paris, more than eighty have terminated happily. This could be easily proved by the registers of the pension office with the minister at war. I will attempt to indicate the causes of it, without, however, pretending to pronounce positively upon the question.

1st. The perpendicular incision, which I make in the centre of the shoulder, marks out with accuracy the rest of the operation, and facilitates its execution; it is, moreover, done in a moment. The two flaps, of the desired dimensions, are then cut in an exact and regular manner, so that this section presents the result of a circular amputation. The head of the humerus is easily dislocated in all possible cases.

By the manner in which I cause the vessels to be seized, previously to dividing the parts in the hollow of the axilla, I prevent all haemorrhage, and place the life of the patient in perfect security; an inappreciable advantage, on which essentially depends the success of the operation.

2nd. Nature effects the cicatrization of flaps with so much the greater facility, as their union takes place in the direction of the longitudinal diameter of the glenoid cavity; the majority of the muscles of the shoulder also are divided lengthwise with their fibres, or cut at their tendinous insertions, a circumstance promotive of reunion, and of the formation of the cicatrix, which becomes linear.

3d. In short, we think that the few nerves belonging to organic life in the shoulder-joint, and the large number of them about the hip-joint, may in general explain the success of one of these operations, and in many cases the failure of the other.

After the preceding remarks, it will be easy to compare my mode of amputating at the shoulder with all the known methods, on which I will not allow myself to pass judgment.

For the amputation of the thigh at its superior articulation, I have nothing to add to my observations in the Memoir

inserted in vol. II. of this same work, P. 186. I shall merely remark, that experience has taught me the indispensable necessity for it in the cases pointed out in this Memoir. Our success proves also its practicability, and, in fine, I am convinced that the plan of operating adopted and described by me, is the most prompt and efficacious. The tying of the crural artery before the operation may be dispensed with, particularly if there be present very intelligent assistants. More advantages are to be derived from applying the ligature afterwards, and to the extremity of each vessel.

PART THE SIXTH.

RETREAT FROM THE CAMPAIGN IN SAXONY.

ON the fifteenth of August, 1813, the time of the expiration of the armistice, we were in hopes of hearing every moment the gun of peace, notwithstanding the considerable preparations, which had been made for a new campaign. On the contrary, however, we learned that the Austrians had attacked our advanced posts. Menaced with a speedy invasion on the side of Bohemia, the army, headquarters, and their *ambulance* commenced their march for Lovemberg, on the nineteenth of the same month. We proceeded again to Bautzen and Gorlitz, and on the fourth day reached the gates of Lovemberg, which is situated at the foot of the first chain of mountains in Bohemia, on the border of the Bober. This truly picturesque country is remarkable for the mildness, generosity, and extreme bounty of its inhabitants. I have never seen a more humane and hospitable people; our soldiers were welcomed with a frank and cordial earnestness. Our advanced guards, after passing through the city, and crossing the river, met with those of the Austro-Russian army, and there ensued a pretty obstinate and doubtful combat, which furnished us with about eight hundred wounded of every class. It was not without difficulty that I secured to them primary succour, the materials of the *ambulances* not having been able to follow the rapid movements of the army. Being always accustomed to carry with me the instruments necessary in important operations, I performed, notwithstanding, all those that were urgent. Besides, the inhabitants of Lovemberg were actively engaged in bringing us linen and fine tow, which we needed for dressing the wounded.

Scarcely had the column in the defile of the mountains been repulsed, when the Emperor Napoleon was informed by a courier extraordinary, that a second body of troops had

invested the city of Dresden, and that a considerable army arrested two of our most skilful generals before Berlin. Our men wheeled about, and returned by forced marches towards the capitol of Saxony, leaving a rear guard at Lovemberg, which was surprised a few days afterwards by the enemy, and almost entirely defeated. By this circumstance our position began to be rendered dangerous; for from this moment we were situated between two strong hostile columns. Reaching the heights of Dresden on the evening of the twenty-sixth, we learned that the Austrian troops already occupied the suburb Pirna. It became then necessary, in entering the city, to make a vigorous attack, in order to dislodge them. The assault proved as successful as could have been desired; indeed, the enemy retreated, and took their station on the edge of the hill before this suburb to the west, where they resolved to await with firmness our approach. We took advantage of the profound darkness of the night to send forward the guard and troops of the army, and posted ourselves for the projected attack of the following day, the twenty-seventh. At break of day, the batteries of the two armies redoubled their fires from all quarters, and the battle commenced and became bloody; but in the midst of the greatest obstacles, and an abundant and constant rain, we gained a most complete victory. The capture of more than thirty thousand Austrians, twenty colours, forty pieces of cannon, and a large quantity of baggage, resulted from this success. General Moreau suffered the loss of both legs, which were carried away by one of our balls; he died in consequence of his wounds three days subsequently. This battle, during which we were exposed to the greatest dangers, furnished us with six thousand five hundred wounded, who were received into the hospitals of Dresden, and attended to as they arrived. The wounded of the enemy, remaining in our power, enjoyed the same surgical advantages as our soldiers. Nearly all the operations that we performed terminated in a happy manner. Wounds of the joints, and those complicated with fractures, were thwarted very shortly afterwards by that sad affection, tetanus, which we have so often observed, and always in moist seasons, or when the temperature passes suddenly from one extreme

to another. Among the means employed by us in its treatment, was the actual cautery applied to the wounds. This agent, and amputation of the injured limb, saved the lives of some patients, the history of whose cases I was not able to collect, in consequence of my being obliged to follow the movements of the army. But, while our troops conquered in the central point of military operations, the corps of Vandame was surprised and defeated in the passes of Toeplitz, at the moment of obtaining the most satisfactory results. The armies which were marching upon Berlin also experienced a great check, so that we did not long enjoy our success in the battle of the twenty-seventh, and it was necessary to abandon the plan of operations pursued until this period.

The unexpected reverses of our troops before Berlin led the allied powers, for whom, moreover, it was difficult to attack our position at Dresden, to reunite their forces on our path of retreat to Leipsic, where doubtless they hoped to arrest our march. Our communication with France was already intercepted, the convoys carried off, and the patients themselves disturbed by partisans.

The Emperor Napoleon, having brought together several divisions of troops of the line, and different corps of the guard, gave orders for a departure. I received this intelligence on the day preceding it, from the intendant-general, and made haste to designate the surgeons necessary for securing surgical aid to six thousand sick, who were still in the hospitals of Dresden. With the disposable surgeons, I recomposed the *ambulances* of head-quarters. The command of the troops destined to guard this capital was entrusted to Marshal Gouvier Saint-Cyr, who was, in all respects, very worthy of the confidence of the army. We entered upon our march on the night between the sixth and seventh of October. The king of Saxony accompanied us, with his family, a circumstance which caused profound dread and lamentation among the inhabitants of Dresden. We followed for some time the banks of the Elbe. The fertile and pleasant looking hillocks on the edge of this river, and the assistance we derived from the peaceable and generous inhabitants of the cities and villages, which we traversed, momentarily removed the

gloomy and painful thoughts excited at first by our peculiar situation, and by our departure from Dresden. After a march of some days we reached the heights of Leipsic. Here we had certain knowledge of the forces and position of the allied armies. They were advancing from Halle to Leipsic, where they hoped to cut off our retreat. We took possession, however, of the latter city, and stationed ourselves at the most favourable points of its line of fortifications. Until this period we had met with but some parties of Cossacks, which were kept aside or dispersed by our advanced troops with the slightest effort. Passing through the city on the fifteenth of October, I stopped some hours in order to visit the hospitals, and cause other places to be prepared for the reception of the wounded in the battle, which I foresaw was inevitable. I gave my instructions on this subject to M. Multon, surgeon-major, who was acting as principal surgeon.

Having adopted, so far as I was interested, all the measures in my power for rendering secure the duties of the hospitals in Leipsic, I repaired on the same evening to the minor head-quarters, which occupied the centre of our army on the road to Dresden. The remainder of the night was spent by me in having prepared the necessary apparatus for the primary dressing of the wounded. I then passed over the greater part of the lines of battle, for the purpose of observing the most favourable situations for the establishment of *ambulances*, and located that of head-quarters at Tomberg.

Although our army had manœuvred a part of the night in order to take a position, it was not yet in readiness when the allied troops, which were much stronger in numbers, and had also advanced during the night, attacked us at break of day on the sixteenth of October. An extremely brisk cannonade took place from all points of the line of battle. Our troops accelerated their movements, and fell upon the enemy in all quarters. The shock was terrible, and the result would have been decisive, had not the allies been so numerous and in so advantageous a position. Their army consisted of nearly three hundred thousand men. Nevertheless, after a combat of eight or nine hours duration, the first ranks of our adversaries were overturned,

their columns shaken, and the field of battle possessed by our troops. This considerable army would have been defeated, had the day lasted some hours longer, and a new effort been made on our part. But the darkness of the night and the excessive fatigue of our soldiers, who had come by forced marches from Dresden, separated the combatants.

We had six thousand five hundred wounded, who were dressed by us on the ground, a very short distance from the field of battle itself, and often under the cannon of the enemy. About the sixth part of them laboured under artillery wounds, all of which required some important operation; these we performed as the cases presented themselves. Several of those who had been subjected to amputation of the arm at the shoulder-joint, were so fortunate as to be capable of being removed almost immediately to France, and to arrive there without making any stoppage. Some of them executed the journey on foot.

I bestowed my services upon Generals Cammas and Latour-Maubourg, who were seriously wounded in this battle; we lost Generals Vial, Delvas, and Friderich, in the heat of the action. The death of these three warriors was a great detriment to the army, and gave rise to the most acute sorrow on my part. They were all my old companions and friends.

General Cammas had had a great portion of the flexor muscles of his right leg carried away by a ball. The wound was dreadful, and appeared to necessitate amputation of the limb. I, however, conceived the hope of saving it, having already several times obtained similar success. With this view, I removed all the disorganized flaps, for the purpose of facilitating the approximation of the sound parts, and rendering the wound as simple as possible. The projectile had not injured the popliteal artery, the pulsations of which were seen.

I applied over the whole wound linen dipped in salt water, by means of which its cut edges were brought together, and maintained in the most favourable relative position. Upon it I placed soft charpee compresses and an appropriate bandage. This officer, being entrusted

to the particular care of a surgeon-major, was cured, and had but very little difficulty in walking.

General Latour-Maubourg, upon whom I operated almost under the fire of the cannon, had received a large ball in his left knee, which had taken off the greater portion of the external part of the head of the tibia, the head of the fibula, the tendons inserted into it, and a part of the calf of the leg. The joint had been opened at its external posterior part, the corresponding condyle of the femur fractured, and the posterior tibial artery ruptured very near its origin from the popliteal vessel. Having made a strict examination of the injury, and caused several assistant surgeons-major, as MM. Bigarrée, Devergie, Bourgeois, and others to do likewise, I pronounced it strictly necessary to amputate the thigh. The operation was desired by the patient, and judged also to be indispensable by these surgeons. It was performed in less than three minutes, and the general was removed to Leipsic, and from this place to Mentz.

All the wounded of this battle were transported, during the night and following day, to Leipsic, where the inhabitants received them with kindness, and lavished upon them all the assistance in their power.

I spent the day of the seventeenth, and the following night, in the *ambulances*, in order to have completed the dressing and removal of our wounded. Our troops began to take the repose which was so necessary; but during this time, the enemy received a considerable reinforcement of men, commanded by a skilful general (Prince Bernadotte), and we were attacked at dawn on the following day, the eighteenth.

From this sudden attack, so much the less was expected, as both armies had suffered greatly in the combat of the sixteenth. At last the battle raged along the whole line, and was already taking a decisive turn in our favour, when our ally troops, as the Bavarians and others, wheeled about and passed over to the enemy. Notwithstanding this complete defection, the French sustained with intrepidity the assault of their innumerable adversaries. These advanced and drew back in turn, and endeavoured in vain to break our line, which was already considerably weakened

by the losses we had sustained. The valour of our soldiers surmounted the almost invincible resistance of the compact columns that pressed upon us from all quarters. The latter were attacked with a kind of fury, which struck them with surprise, and greatly staggered them. In short, after a most obstinate fight of twelve or fourteen hours, the French army preserved its ground, nearly as in the battle of the sixteenth. Information, however, being received of a more considerable union of adversary troops about Leipsic, and of new obstacles which were prepared against our return to France, with which our communication was again cut off, a retreat was ordered and effected during the night between the eighteenth and nineteenth, the fatal anniversary of our departure from Moscow.

This combat, a bloody encounter, furnished us with many wounded, and is the only engagement in which I have not been able to tell the precise number. The greater part of them belonged to the guard, which sustained the principal attacks.

A large proportion of serious wounds required difficult operations, and I did not cease performing them during the first twenty-four hours, directing at the same time, the dressing of all the injured. Several individuals, who had undergone amputation at the shoulder, were scarcely released from my hands, when they entered upon their journey, and took advantage of the first moments to repair to France, while the communication with it was yet free. They travelled from Leipsic to Mentz without stopping, their wounds being dressed at distant intervals by the first comers, and at last reached their own country perfectly cured. These extraordinary successes appear to us to justify the advantages of the method we have adopted in the performance of this operation.

The majority of the wounded in the battle of the eighteenth, like those of that of the sixteenth, were transported to Leipsic. A large number belonging to the guard were conveyed in the covered waggons of the government, after the army, and thus saved from the catastrophe in this city. To Baron Dufour, commander of this corps, do these brave individuals in part owe their preservation.

The retreat commenced at midnight, and was conducted

in pretty good order, until the following morning. In order to facilitate the passage across the canals, which intersect the road to France on leaving Leipsic, it was desirable that a certain number of bridges had been constructed over them, and the establishment of several outlets in the feeble walls, which surround the city on this side, also constituted an object to be wished for. It does not belong to me to judge whether or not these plans could have been put in execution.

The moment our march was perceived by the enemy, they came upon us, harassed our rear-guards, and pursued them to the gates of the city. The fire of their artillery, exercising its effects even within the enclosure of the place, precipitated the progress of our troops, which being forced to engage on issuing from it, in the narrow defile of the grand route, soon became embarrassed. The confusion was dreadful; the enemy arrived from all quarters, and inspired the whole column with awe. Several of the gates, that were still closed, were opened by the allied troops of the garrison, and the catastrophe, in which a part of the French army suffered as victims a very few hours afterwards, was thus hastened. Orders had been given to destroy the first bridge on the path of retreat, at the first appearance of the enemy, and after our troops had crossed it. Regard was doubtless paid only to the former circumstance, and hence resulted the fatal error of removing the bridge, when all our baggage and a large portion of the artillery, together with many of our companions, were still in the city. I had made my way across this unlucky passage some moments before the event. Nearly all my assistants of the light *ambulances* were also saved, but all the materials of the latter, without exception, remained in Leipsic.

This intelligence gave rise to consternation among the rest of the army, which effected its march with pain and difficulty. It reached Hanau, however, without great obstacles. On our way to Erfurt we had some hours rest, of which advantage was taken to make regular distributions and to arm the citadel. We were preceded by an advanced guard, which was distant from us two short days' march. These troops had just passed through the city of Hanau when General Wrede crossed the Main, and was

proceeding to station himself with his soldiers on the road between the river and a marshy ground, so as to cut off our retreat. Our position was extremely critical, and none of us dared entertain hopes of escaping from it. Wishing to avoid a battle, we looked in vain for a lateral passage; it became necessary to attack the enemy in this, as it were, impregnable position.

Some of our regiments advanced immediately, repulsed the advanced posts of the enemy and attacked their lines, but without breaking them. They were, however, forced to fall back in some points. The fire of artillery scattered with profusion shells and bullets among our ranks, and the danger was imminent. It then was requisite to overcome these obstacles, even at the peril of life, or surrender at the discretion of the Bavarians.

In this difficult situation, the chief of the army advanced in person at the head of his guard, and after some skilful manœuvres caused it to rush against the enemy. The infantry routed the battalions lying in ambuscade in the forest or entrenched on the road, while the cavalry charged with remarkable impetuosity and energy the numerous corps of horse and foot, that defended the passage to the left of the city. The first shock was terrible; but it resulted in the almost entire defeat of the enemy, who were forced from their position, overcome and repulsed in all quarters. A large number of Bavarians remained on the field of battle; others took to flight, and repassed the Main with precipitation, destroying the bridges behind them. A part of the artillery fell into our power, and our communications were completely re-established. As the battle continued pretty far into the night, it was necessary to spend the remainder of it on the ground. The soil was humid and sandy, and abounded in large oaks, which could not be burned. We were very remote from all habitations, and consequently destitute of shelter and subsistence for the men and forage for the horses. The weather was cold and foggy, and on this account the bivouac was one of the most painful we have ever witnessed. Notwithstanding these dismal circumstances, and the entire absence of the materials of the *ambulances*, which we had lost in the sad affair at Leipsic, all our wounded, who fortunately were not nu-

merous, were dressed and operated upon. All the operations were performed with the instruments I had preserved, being accustomed to carry them on my horse. We found also a sufficiency of linen in the sacks of the wounded soldiers, or in our portmanteaux for the primary dressings. Few surgeons remained with me; but I must commend the zeal and activity of those who had had the good fortune to escape the dangers of the campaign, and had been enabled to follow me. Among these were several surgeons of the guard, habituated for a long period to the fatigues of war, as MM. Zink, surgeon-major, Desruelles and Meunier assistants-major.

Of the seriously wounded soldiers, upon whom we operated on the field of battle, I shall notice a lieutenant of light infantry of the guard that lost two limbs in this combat. This young officer, named Robsomen, brother-in-law of General Gros, his colonel, was marching at the head of his column when he was struck by a ball, which carried away his left fore-arm at the elbow. He was conducted behind the line of combatants, where I met with him, when he was wounded, some steps from my position, by a second bullet, which entirely took off the right leg near the knee-joint. His father, captain of the light troops of the ex-guard, informed of his first accident, ran to his assistance, and found him lying nearly dead on the sand. The concussion of the interior organs, caused by the two balls, the considerable loss of blood experienced by him, and the cold and privations he had felt, reduced him to this alarming state. The father, however, possessed of great courage and sensibility, took his son upon his shoulders and eagerly brought him to me, in order to request my services.

He was pale, discoloured and destitute of heat, and the pulsations of the radial arteries could scarcely be felt. In spite of his extreme prostration and exhaustion, I saw the imperious necessity for amputating immediately the two mutilated members. Being very near the place of combat, I found myself alone with one of my pupils, and the father of this young man. I durst not propose to the latter to hold his son during the two serious operations which I was about to perform, and looked around in vain

for the assistants whom I needed. " You may rely upon me, Sir," said the captain to me, " since the matter concerns the preservation of my son's life." The latter did not send forth a cry during the operation, and the father exhibited uncommon firmness.

In the first place, I amputated the arm. Its vessels having been ruptured little haemorrhage took place. I immediately afterwards took off the leg through the head of the tibia, instead of ascending to the thigh, as the wound appeared to indicate. Sufficient linen was found about the patient and myself for dressing the two wounds, that resulted from the amputation of the limbs.

I calculated little on the success of my operations, the debility of their subject being considered. I, however, advised M. Robsomen, the father, to look for some soldiers, who might convey his son to the first village; and induced him to become a prisoner, and to remain with his filial patient until his cure, or until he was properly located in one of the neighbouring cities.

My counsel was followed, and to my great surprise this young soldier visited me on his return from the prisons of Germany, in October, 1814. This fact, of a character pretty remarkable for the seriousness of the wounds and the causes which produced them, confirms the necessity of operating immediately, when this measure is indicated; some moments later, and young Robsomen would have died.

I extirpated the arm at the shoulder-joint in several individuals, who have also been saved. Two of them followed on foot to Mentz. On the morning of the following day, we sent to Hanau, to seek for men and means of transportation, in order to have all the wounded, whom we had on the field of battle, carried into the city; this was done with great celerity. The majority of them were removed to Franckfort, and I have since learned that they were very well treated in these two cities, as was also the case with the surgeons, whom I left with them.

The army continued its march to Mentz, where we arrived during the night between the first and second of November, 1813.

PART THE SEVENTH.

CAMPAIGN IN FRANCE.

FROM Mentz, where I made a short stay, until my arrival at Metz and Paris, I was occupied with measures for the improvement of the situation of the *ambulance* depots; I also endeavoured to arrest, as far as possible, the progress of an epidemic, which was already making very great ravages on the line of evacuation.

In order to give my readers an idea of all it was necessary for me to do, I will commence by placing before them the extract of a report, dated, December the tenth, 1813, which I addressed from Metz to his excellency the minister at war. I will afterwards give an account of every thing, which appears to me to merit attention, having reference either to the health of the troops, or to surgery, dilating very little on the military operations, the progress of which was so rapid, that it would have been very difficult to observe them.

Report made to his Excellency, the Minister at War.

Metz, December 10th, 1813.

“ MY LORD,

“ HAVING terminated my administrative labours, and organized, so far I was concerned, the medical staff of the hospitals of Mentz, I received, from the intendant-general of the army, orders to repair to Metz and inspect the line of evacuation established between these two cities. At each principal station, I have rendered to this officer an account of the measures I was enabled to adopt, or which it was my duty to solicit of him for the improvement of the *ambulances* inspected by me, and am now anxious to pre-

sent your excellency with a sketch of the result of my observations.

“ I must confess, my lord, that from Mentz to Sarrebruck I have discovered all the depots of *ambulance* to be in a very bad state, and have found it requisite to spend a part of the nights in personally removing, or causing to be removed, the bodies that had been buried for several days under the rotten straw, where a large number of living persons were still lying. I have also been engaged in having the dead buried, and in making healthy the places which contained them. I have written to the intendant-general, praying him to send to these *ambulances* all the succour they needed; for the inhabitants beyond the Sarre appeared to be no longer capable of supplying their necessities. At Landstoul, for instance, at the risk of all becoming the victims of the epidemic which there prevailed, twenty-five bodies of those who had been dead for several days, were left in the church situated in the midst of the city, in itself very unhealthy. Nothing could induce them to remove the bodies from this situation, which, indeed, was very much infected, in order to have them interred.

“ I have reason to believe, that the intendant-general, Baron Marchand, will engage in measures for improving these establishments, with the zeal and activity of which you are aware he is possessed. I have seen the physicians in the communes through which the troops pass, and have submitted to them my observations on the nature and causes of the epidemic, and the means which I thought should be employed for arresting its progress, and preventing its grievous consequences. We shall have occasion to speak of them hereafter. I have visited the inhabitants of the cities and country, and have given them all the consolation in my power.

“ Previously to my departure from each of these places, I have had the satisfaction to see that the inhabitants were encouraged and disposed to follow strictly the rules which were prescribed for them. I have since been informed, that my advice did not prove useless.

“ From Sarrebruck to Metz, inclusively, I have found all the hospitals in the best possible condition. The citi-

zens, as well as the administrative authorities are worthy of the greatest praise for their vigilant and assiduous care of our sick. We are particularly indebted to Baron Marchand, mayor of Metz, who unites uncommon philanthropy to extensive knowledge in medicine and governmental concerns."

The rest of my report related to the medical staff of the army and regiments.

During the few days I remained at Metz, I contributed so far as I could to the improvement of the duties of the hospitals. In the first place, I caused the different patients, whom circumstances had collected in the same halls, to be classed and separated. Special attention was paid to the wounded, and I performed some difficult operations, which were attended with unexpected success. They were accompanied with clinical lectures on surgery, which I gave for the young surgeons in Metz.

The epidemic malady continued its progress in the countries contiguous to head-quarters. I received orders from the intendant-general to travel over them, as much for the purpose of knowing the condition of the sick, as to look into the situation of the military hospitals established or to be established in the principal places through which the troops were to pass. The effects of this epidemic were much exaggerated, and the malady was supposed by the young physicians sent from Paris to be pestilential and eminently contagious; thus had they proposed, for the first measure, *the express prohibition of a communication between the soldiers and inhabitants of the cities and country.*

This step, besides being impracticable at this period, would have created alarm among all classes of the citizens, without remedying the causes of propagation and unhealthfulness. I will not bestow any reflections on the different modes of treatment recommended or practised by these zealous physicians; but I may remark, in praise of those of the army, that the method pursued by them in the hospitals was as successful as could have been expected. No one could, certainly, be more capable than the latter of giving useful advice and proposing efficacious measures for the general treatment of this epidemic: but

it was not judged proper to consult them. The first physicians of our army, however, MM. Gory, Maillard, Boulac and Monceau, made to the intendant-general and minister at war particular and collective reports, by which it was very easy to lay down general instructions for describing the disease, making known its causes, the manner of treating it, diminishing its effects, and arresting the contagion, when it occurred, a circumstance we have rarely observed.

In my first inspection, I visited the hospitals and invalid inhabitants of Pont-a-Mousson, Nancy, Thiaucourt, Saint-Benoit, Manthul, Verdum, Etain, and Malatour. The epidemic every where appeared to us to be essentially a catarrhal inflammatory and asthenic affection, seated in all the mucous membranes, and often complicated with gangrene from congelation of the limbs, produced by the cold and humid bivouacs during the retreat from Saxony. This catarrhal affection was accompanied, in nearly all the patients, by laborious and painful expectoration and diarrhoea or dysentery; in some there were symptoms of engorgement in the membranes of the brain or its proper substance. But in general these phenomena progressed slowly, and presented nothing of a very alarming character, so that there was always time to attack the disease by the means indicated. The unwholesomeness of the places, crowding together of individuals, and bad regimen caused a diffusion of the epidemic in certain places, as I have said in my particular reports, rendered the disease more violent, and impeded a salutary crisis. Thus, for example, in situations where the mortality was proportionally greater than in others, I discovered sources of infection in the houses themselves or contiguous to them, and the ridiculous prejudice, which led to the confinement of the sick in their rooms heated by cast iron stoves and coal, contributed to their destruction. Sudorifics and drastic purgatives were employed. It was at first very difficult to change this practice; however, the salutary alterations, which were daily effected in the patients treated by the physicians of our army, gradually inspired confidence and dissipated preconceived notions. Every where, I adopted or proposed the measures which I thought proper for

general salubrity, for the improvement of the hospitals, and the treatment of patients of all classes. An account of the result of my inspection and labours was given to the intendant-general and his Excellency the minister of war. Having since obtained a knowledge of the nature of the reports made by the above mentioned medical men, I have seen with satisfaction that we agreed on the greater number of points.

On my return to Metz, I obtained permission to proceed to Paris, and spent some days in this capital with my family, which I had not seen since my departure to Russia in February, 1812.

Head-quarters were soon removed from Metz to *Châlons-sur-Marne*, whither the commander-in-chief of the army was not tardy in repairing. Having received orders to follow him, I sat out in all haste, and arrived in this city January twenty-fifth, 1814, as he was leaving it to attack the enemy, who were advancing by forced marches from all quarters.

Being informed of the direction pursued by head-quarters, I entered upon my journey on the following day, and, after a march of forty-eight hours, arrived on the morning of the thirtieth, in the neighbourhood of Brienne, where I found five hundred individuals who had been wounded in a battle fought by the advanced guard, at the gates of this city. This combat, in which perished count Bast, one of our bravest and most skilful generals, and colonel of the marines of the guard, had resulted in the capture of the castle of Brienne, and the precipitate retreat of the enemy. Our troops reconnoitred to the distance of some leagues from the city, and stationed themselves on the heights of this place.

The days of the thirtieth and thirty-first were spent in observation. During this period I organized a stationary *ambulance* in the civil hospital, in which I caused all the most seriously wounded in the battle of the twenty-ninth to be placed. Among these were two Russian officers, on one of whom I performed the operation for empyema; it doubtless terminated happily, for the patient was doing very well at the time of our departure. I executed several other important operations, such as amputation of the arm

at the shoulder, and superior part of the thigh, with a flap.

Arrangements were made for leaving Brienne and proceeding to Troyes, when our advanced guards were attacked by superior forces on the first of February. A part of them were surprised and fell into the power of the enemy; the rest joined in battle, and arrested their rapid march. The combat was commenced, and the affair became general. A heavy and icy snow, which fell incessantly all day, singularly impeded our manœuvres. To this cause, and principally to the small number of our troops may be attributed the disadvantage under which we laboured in this battle. Our troops, however, finally resisted the shock of the enemy and arrested them at the entrance into the city. The retreat to Troyes was effected in the greatest order. The wounded of this engagement we dressed during the night. I located together, in the church and hospital of Charity, those who were most seriously injured, and was charged with the remittance of fifty pieces of gold to the superior of the sisters of this institution, for the purpose of aiding them in succouring the wounded. Others of the latter I caused to be conveyed to Troyes, where they preceded the army. We reached this city without much difficulty on the evening of the third. Here we found the elder guard, which had been much needed at Brienne. From this moment the army thought itself invincible, and, indeed, in every situation where it afterwards had to contend with the enemy, obtained successes of a more or less brilliant character.

I pass hastily over the memorable and glorious battles, Champaubert, Montmirail, Chateau-Thierry, and Montreau, in order to dwell for a few moments on the battle of Craonne.

Subsequently to the engagements of Montmirail, and Chateau-Thierry we arrived by forced marches at Guignes, where was met the head of the Austrian column, which was moving towards Paris. Scarcely had our advanced guards, composed of dragoons from the army of Spain, recognized it, when they rushed upon the enemy like lightning. Never was there a more vigorous attack; the hostile troops gave way almost at every point. The charge of our dragoons broke in

the twinkling of an eye the squares of Austrian infantry, and routed them with great loss. The cavalry of our advanced guards seized upon all the artillery destined to defend the column of the enemy, and took from five to six thousand prisoners. The rest of the army retreated precipitately to Montereau, the position of which was impregnable. The progress of the Austrians was here indeed arrested, but as we pursued them closely, they were soon attacked in this situation. Marshal Victor directed the assault. The enemy maintained their station until the arrival of the guard, at the head of which was a battalion of gendarmes on foot, of uncommon bravery. In concert with the troops of the marshal, they overthrew those that defended the upper part of the bridge, and made themselves masters of the city. The castle was abandoned, and the Austrian corps, charged with the defence of this important post, dispersed. A pretty large number perished during the impetuous assault which was made by our soldiers in the midst of the city, and the passage of the bridges ; the streets also were filled with the dead and the dying. We had on our side very few wounded, some of them being men of distinction. Among the latter was General Chateau, commander of the advanced guard of the Duke of Bellune. The stroke of a ball, which he received in the first charge at the head of his column, the mouth of the gun being applied almost immediately to his body, shattered his right arm very near the shoulder-joint, and the projectile was lost in the contiguous parts under the scapula. I proposed to him the removal of the limb, for I perceived it to be indispensable. He humorously rejected my offer, and wished nothing more to be said on the subject. Upon his refusal, I called in consultation one of my colleagues, who thought the operation should not be performed. It was then my duty to restrict myself to a simple dressing, having fulfilled the indications ; the general I caused to be conveyed towards Paris. The grievous symptoms that I had indicated were developed, and continuing without intermission, terminated in the death of the patient.

I caused all the wounded to be collected together in the hospitals of Montereau, where I had them dressed, and successively removed towards the capital.

We fruitlessly pursued the enemy in different directions; it was impossible to overtake them. We made marches and counter-marches. One of our columns, however, was arrested in Mery, at the moment when we calculated on traversing this city to repair to Arcis-sur-Aube, which had become the central point of military operations. At the time of the attack, the enemy burned the bridge, and fired the city. It was no longer possible to pass, and our troops retrograded, in order to proceed to Troyes. The affair at Mery furnished us with some hundred wounded. Among these was Baron Gruyeres, one of the generals of the advanced guard, whom I dressed on the field of battle. His right arm had been penetrated by a ball, the middle part of the bone shattered, but the soft parts little injured. This was a less serious injury than that sustained by General Chateau, and I refused to amputate the limb, although the patient requested me to do so. He was dressed with care and removed to Paris, whither my nephew, Augustus-Alexis Larrey, an assistant-major surgeon, accompanied him; he continued his services until the recovery of the patient, which took place at the expiration of the fourth month.

After several marches and manœuvres, that could scarcely be observed for their rapidity, we finally succeeded in forcing the enemy to halt, and accept a pitched battle. The greater part of their forces stationed themselves on the mountains of Craonne on the grand route, their advanced guards extending to Corbigny. They were attacked in this latter position by some detachments of the guard. In this first assault we had very few wounded, among whom was General Cambronne; his wound, though of a serious nature, presented nothing particular.

Having forced the first line of the enemy, we seized upon Craonne, and the two armies came together on the morning of the seventh, occupying the plain which covered the plat-form situated half a league from this town.

A simultaneous attack was not tardily made, the battle became bloody, and was continued until the approach of night. The enemy at first made a strong resistance; but, although they were very superior in numbers, their troops were obliged to yield to the experienced valor of our

soldiers, who overthrew their lines, broke their columns, and forced them to retreat.

This battle furnished us with from a thousand to twelve hundred wounded, the fourth part of whom at least were grievously injured. About ninety of the latter were subjected to one or two amputations. The following generals also received serious wounds.

The first was Marshal Victor, duke of Bellune, who contributed greatly to our success in the engagement. He laboured under a bullet-wound in his left thigh. The projectile had traversed the limb, from the internal side of it to a point diametrically opposite. The femoral artery was denuded of its cellular envelope, and every thing led to the apprehension of its rupture by the least exertion or by suppuration. I took care to lay open the points of entrance and exit of the ball, to place on the thigh a retentive bandage, and to have this distinguished patient conveyed in a litter, which was made at Craonne. Notwithstanding this dressing and these precautions, the marshal, during the treatment of his wounds, became the subject of several accidents, which retarded his cure for some months.

Count Grouchy, the chief general of the cavalry, received, at the moment of an impetuous charge, a violent contusion, caused by a cannon-ball, in the right knee. His horse, struck by the same ball, fell and was killed under him. The general was thrown down, and the accident thus aggravated. He was first dressed with means to produce resolution, and conveyed to Craonne, where I saw him that night. The inflammatory engorgement, which had already supervened, required the application of several cups with scarifications and emollient anodyne cataplasms, their continuation being carefully attended to. The general was so fortunate as to preserve his leg and powers of progression.

The general, Count of Feriere was conveyed to the same *ambulance*, established in the mill of —, immediately behind the field of battle. A cannon-ball had carried away, together with the heel, the internal half of the bones of the tarsus, and shattered the first two bones of the metatarsus. The internal maleolus was broken, and the fracture extended into the tarso-tibial articulation. The

patient, like several surgeons-major in the *ambulance*, having perceived the necessity for an immediate amputation, communicated to me his wish to have it performed at the lower part of his leg. I refused to act according to his request, knowing from experience, as I believe I have shown in another article of my campaigns, that this amputation rarely succeeds, and that it does not offer any real advantage over that which is performed at a selected point, indicated by all authors, and which I have changed by carrying the point of operation some lines above. I gave the preference to the latter, and executed it with all possible celerity. Notwithstanding the extreme sensibility of the patient, he supported himself under it with the greatest fortitude. Some disturbance manifested itself during the treatment of the wound in the stump, the edges of which I had brought together with a loose linen application; for immediate re-union of the sensitive parts, in this extremely irritable individual, would undoubtedly have provoked tetanus. He bore, with very great difficulty, the simply retentive apparatus employed during the treatment, and was at no time able to suffer the use of the roller around the stump. This imperfection in the dressings impeded the union between the tibia and fibula, which constantly takes place after amputation of the leg (as I have elsewhere said), and should occur, in order to diminish the size of the stump, and give to the patient more solidity of support.

The general of Férière is perfectly cured; but the separation and mobility of the two fragments of bone cause pain and difficulty in walking.

The general, Count of Sparre, received a considerable wound in his right leg, from an howitzer, accompanied with loss of substance in the integuments, and fracture in the whole substance of the middle portion of the tibia. It was one of those cases in which amputation appeared to be indicated; the fibula, however, and muscles on the posterior part of the limb being uninjured, I conceived the hope of preserving the leg. I first laid open the wound, extracted the principal splinters of bone, and reduced it to the most simple state. An apparatus for fracture was then applied, and the general conveyed to Paris, where he arrived, with-

out any unfavourable symptoms. None took place in the course of the malady, the patient being cured so happily, as to be enabled to walk without crutches.

The extraordinary success in this case should be attributed especially to the operation, it being performed immediately, and to the kind of fracture apparatus, (the subject of a particular memoir) which we have always employed with advantage.

Having secured succour, during the combat, to the wounded, whom I had located together in the *ambulance* of the mill, where I operated upon the above mentioned generals, I had to repair to the town of Craonne, in order to organize in it another *ambulance*, and to cause the wounded to be dressed, who had there taken refuge, and had not yet received any relief. Here I experienced the greatest difficulties, attendant on administering to them assistance of the most indispensable character. All the wounded dispersed in this commune were collected together, by my direction, in deserted private houses. I left with these patients a division of surgeons, whom we cannot sufficiently commend.

This duty being fulfilled, I proceeded in all haste to the *ambulance* of the first line of battle, which we had established during the engagement on the farm of Hurbise. More than two hundred wounded, nearly all mutilated by artillery, had been forgotten in the yard of this farm. We found them with difficulty; some were concealed in the dung, others were covered with snow. Although we were remote from the army, and surrounded by Cossacks, I thought it my duty to risk being made prisoner with my assistants, rather than abandon these unfortunate individuals to the sad fate that awaited them. Several had already perished, from haemorrhage or acute pain occasioned by the laceration and complete attrition of their limbs. In the mean time, I adopted some precautionary measures, and in the first place, caused all the peasants of the village contiguous to the farm to be called, exhorting them to bring bread, meat, wine, and beer, for the wounded. I then charged M. Desruelles, one of the most intelligent surgeons, with the duty of having remitted to these inhabitants the weapons of the wounded, and placing them thus

armed at the gates of the farm, so that they might watch for the safety of the place, while we were occupied with dressing the wounded.

Some sheets, window-curtains, tow, and rags, which we found on this farm, served for the completion of our dressings. Every thing being arranged, I commenced the operations, and performed all those that presented any difficulties. The wounded were then placed, as they were operated upon, in the stables and interior of the house. The peasants, who had kept guard for our preservation, furnished them with the sustenance they needed. I left with them some surgeons, who were to accompany them to their points of destination, when they should be removed, and we rejoined head-quarters at Champignon, during the night.

On our arrival, the troops were on their march to Laon, at that time occupied by the Prussians. Vain attacks were made by them, and several fruitless battles fought. It became necessary to lay aside our attempts to capture Laon, the position of which was, moreover, inaccessible. These obstinate combats, which we could perhaps have avoided, furnished us with many wounded, nearly all of whom belonged to the junior guard. They were dressed on the scenes of the engagements, and removed to Soissons, whither we were not tardy in repairing. During our stay in this place, I visited the hospitals, and made in them some improvements. I caused those patients to be classed, who had been brought together confusedly in different places, some of which were abolished as hospitals, on account of their unwholesomeness. Several hundred wounded Russians, especially needed assistance. I had all of them collected together in one situation, and, having caused them to be dressed in my presence, recommended their cases, particularly, to the authorities of the civil institutions, and the muster-master. From Soissons, our troops proceeded to Rheims, where we again engaged in a serious battle. The guards of honour, commanded by the general, count of Ségur, greatly distinguished themselves in the assault upon the city. They carried the first posts and batteries at the gate of entrance, with inconceivable rapidity, and uncommon bravery. We had few wounded, among whom was the count of Segur himself. In the hos-

pitals, were found about four hundred wounded Russians and Prussians. I caused their surgeons to be respected, and we left them with their sick, to whom they in conjunction with us, administered all the surgical assistance required.

Some delicate operations were performed by me, two being extirpations of the arm at the shoulder. I have since been informed that these two individuals recovered. I admired the zeal and activity of M. Noel, surgeon-major of the military hospital, in which these foreign patients were located, and must also commend the attentive care exhibited towards our wounded by M. Quesnel, surgeon-major of the Hotel-Dieu, and all the other surgeons of Rheims.

The enemy had effected their retreat towards Arcis. We pursued them by forced marches, and came up with their rear-guards at the passage of the bridge. Although their position was an advantageous one, and easily defended, they scarcely made any resistance, and abandoning the city, proceeded to join battle at the bottom of the plain. Our van-guard rapidly advanced, and persuaded doubtless that we had to contend but with a part of the allied troops, displayed their ranks on going out from Arcis, and marched forward.

I followed this rapid movement with two or three of my pupils; but I soon saw with astonishment very numerous bodies of Cossacks rushing upon us, and quickly covering the whole plain. We were about to be surrounded, when the emperor Napoleon formed squares with the small number of troops under his observation, and supported them against the walls of the place, where they were protected by some pieces of cannon. The capture of our advanced guard would have opened to the enemy the gates of the city, in which there might have occurred a sad catastrophe. The firm conduct of this small body of troops, however, gave time for the arrival of the guard and for drawing out in order of battle behind the squares. At the sight of our grenadiers' caps the Russians retired, and resumed their former position. The whole army advanced, and we had reason to believe in the occurrence of a pitched battle, which was vainly offered

by us during the entire day. I returned into the city for the purpose of causing a continuation of the dressing of the wounded, who had been located together in the hospital and a large house. Night coming on, we retraced our steps and again crossed the river. In this retreat, which was conducted with order, we had more wounded, who were attended to and successively removed to the *ambulances* of the interior.

Instead of proceeding to Paris, the French army marched upon Saint-Dizier, and discovered the route to the capital. The allied army took advantage of this counter-march to seize upon the roads, while we were pursued by a corps of cavalry.

From Saint-Dizier our troops moved on to Vassy, whence we returned immediately to the former place, meeting here the body of cavalry, already alluded to. Having fought and dispersed it, we suddenly changed the plan of military operations, and marched in all haste to Troyes, in order to advance thence into the interior.

On our arrival at Troyes, we became convinced that the information received by us at Saint-Dizier, of the progress of the allied armies towards Paris, was true. Our movements were directed thither with rapidity; but as the bridges across the Seine were cut down, it was necessary for us to pass to Sens and to Pont-sur-Yonne. This route retarded us twenty-four hours, and the capital had just been surrendered, when our advanced guards entered Fontainbleau.

Here terminates my twenty-fourth campaign. Our troops, learning the occupation of Paris, determined upon a capitulation. All France was speedily invaded by the numerous forces of the hostile powers. The political government of this nation was changed. Napoleon abdicated the supreme authority, and retired to the island of Elba, the throne being re-ascended by the ancient family of our kings. I at last had a glimpse of the termination of my labours, and the painful vicissitudes I had incessantly experienced until this period.

In order to acquit myself totally of my obligations, I was eager in addressing to the minister at war a report, in which I explained, as first surgeon of the grand army, the

result of the operations relating to my staff during the last campaigns. The army having been disbanded, I repaired to Paris with the principal members of the administrative head-quarters, whose duties had ceased. On my arrival I resumed, in the inspection of the medical staff of the armies and in the military hospital of Gros-Caillou, my functions as inspector-general and surgeon-in-chief.

How painful soever to me has been the loss of one of these employments,* I am not the less occupied with new researches into the little known causes of several of the maladies already mentioned, regarding, moreover, the esteem and consideration of the public as the most flattering recompense for the man of sensibility, and the most worthy of his ambition; happy, if I have been able to merit it by my zeal in the fulfilment of my duties, and by the efforts I have incessantly made to contribute to the progress of a science, to which my life has been consecrated! especially happy, if I can still be useful to my country, by presenting to it the results of my labours, observations, and thirty years honourable services!

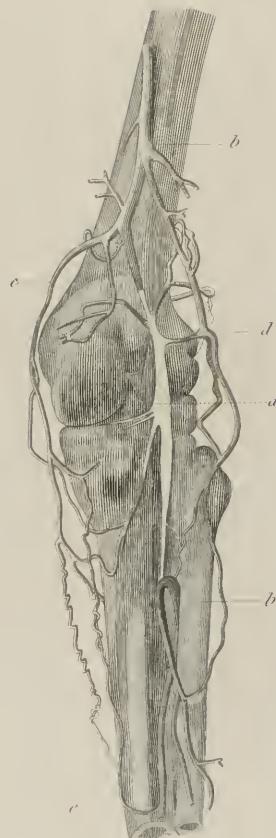
* The general inspection was suppressed, January 15th, 1816, and succeeded by a council of health.

FINIS.

5



7



2.



4



5



1 The posterior part of the preparation.
 2&3 The internal and external sides.
 a a Popliteal artery obliterated.
 b b b b b b Superior and inferior portions having preserved their calibre.
 c c New internal branch.
 d d The external do.
 e e New anastomosis between the internal branch and posterior tibial artery.
 f f Vessel of communication between the anterior branch and anterior tibial artery.
 4 Popliteal artery in a healthy state relatively to the knee joint.
 5 Popliteal artery in a healthy state isolated and with its branches.

Bacon Larrat's mode of operating

Fig. 1.



Fig. 2.



Fig. 3.

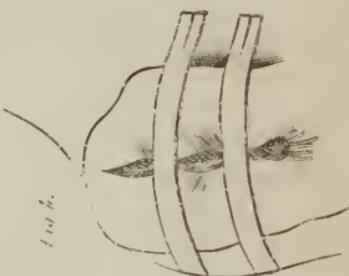


Fig. 1. First stage of the operation. *Anite in a position to form the flap.*

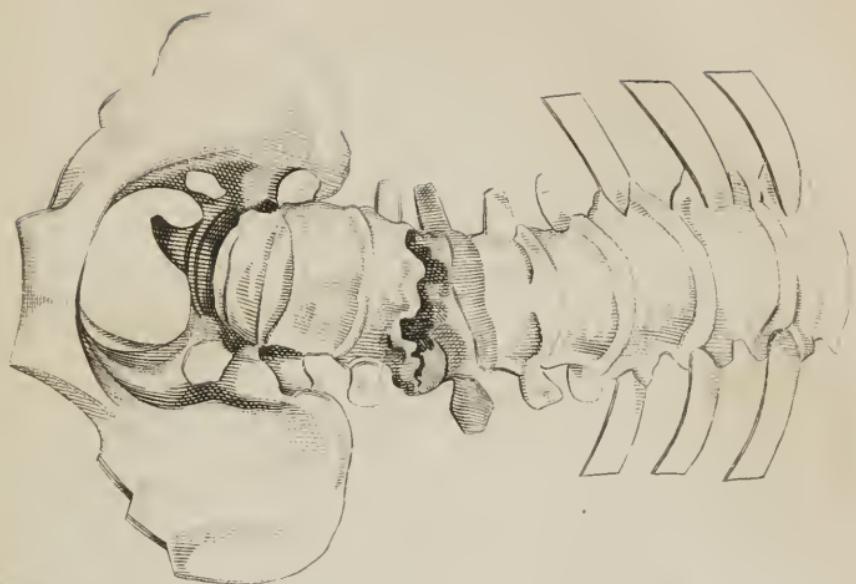
Fig. 2. *Flap of the thumb cut off its distribution covered with its capsule and the caps thereof drawn*

Fig. 3. *Result of the operation representing the division of the muscles and the tendons. Fix & turn on the flap of the wound by adhesive strapping, and the hand is ready for*



4







6



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ANDREW CRAWFORD, M. D. Physician to the Hampshire County Hospital, Winchester.

WILLIAM CUMIN, M. D. Glasgow.

JAMES CUSACK, M. B. Steevens' Hospital, Dublin.

JOHN DARWALL, M. D. Physician to the General Dispensary, Birmingham.

D. D. DAVIS, M. D. M. R. S. L. Professor of Midwifery in the London University.

JOHN ELLIOTSON, M. D. F. R. S. Physician to St. Thomas's Hospital.

R. J. GRAVES, M. D. M. R. I. A. King's Professor of the Institutes of Medicine, Honorary Fellow of the King's and Queen's College of Physicians, Physician to the Meath Hospital and County of Dublin Infirmary.

GEORGE GREGORY, M. D. Physician to the Small-Pox Hospital.

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J. HOPE, M. D. Member of the Royal College of Physicians, London.

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ROBERT LEE, M. D. F. R. S. Physician to the British Lying-in Hospital.

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H. MARSH, M. D. M. R. I. A. Professor of the Principles and Practice of Medicine to the Royal College of Surgeons in Ireland, &c. Dublin.

JONES QUAIN, M. B. Lecturer on Anatomy and Physiology in the Medical School, Aldersgate-Street.

J. C. PRICHARD, M. D. F. R. S. Physician to the Infirmary and to St. Peter's Hospital, Bristol.

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